

JRC TECHNICAL REPORTS

European Union Location Framework Blueprint

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Abstract

The European Union Location Framework (EULF) is a package of recommendations, guidelines and actions to promote the effective use of interoperable location information in e-government services. The EULF was initially developed in the ISA Programme, which supported interoperability solutions, sharing and re-use among European Public Administrations. It is now being enhanced and applied further through the European Location Interoperability Solutions for e-Government (ELISE) action in the successor [ISA²](#) Programme. ISA² develops digital solutions that enable interoperable public services across borders and sectors for the benefit of public administrations, businesses and citizens in the EU. [ISA² solutions](#) can be used free of charge and are [open source](#) when related to IT.

A EULF Strategic Vision has been published that defines the policy approach based on an in-depth survey and assessment of Member States. Five focus areas were established: policy and strategy alignment, e-government integration, standardisation and interoperability, return on investment and effective governance and partnerships. The 'current state' assessment and desired 'future state' (what good looks like) are summarised in each focus area, outlining the direction of travel to make the necessary strategic improvements.

This 'strategic framework' is complemented by an 'implementation framework', providing practical recommendations and guidance in the five focus areas. An overview of the recommended implementation approach is outlined in this EULF Blueprint, which contains a series of recommendations in the five focus areas, with each recommendation including guidance on how the recommendation may be undertaken, why the recommendation is being made, who it is targeted at, the risks to be considered, as well as where further information and best practices can be found. Illustrations of best practices are provided to give additional context.

In a number of cases, the outline recommendations and guidance in this Blueprint is supplemented by more detailed guidelines. Such detailed guidelines have been prepared or are planned on the following topics: procurement, standards and architectures, policy alignment, e-government service design, location privacy, geodata and statistics, and Digital Single Market actions to improve the free flow of location data.

The EULF also involves studies and pilots in key policy areas, to promote the use of the framework in tackling real-world issues, e.g. in delivering public authority road safety data to improve the accuracy of vehicle navigation systems, developing a harmonised data approach to support improvements in the energy efficiency of buildings, and facilitating e-reporting for European marine policy.

The overall framework has been developed through wide consultation with stakeholders in Member States and Commission Services, and the Working Group for Spatial Information and Services, which is part of the governance for the ISA programme and advises on specific content and priorities for guidance and action.

Introduction

The European Union Location Framework (EULF) aims to maximise the potential of the vast amount of money spent on location-related information and services by governments across Europe by promoting a best practice approach for cross-sector and cross-border sharing and use of this information, based on user needs and priorities, and targeting actions that will deliver efficiencies, help improve digital public services, and contribute to job creation and growth. The vision for the EULF can be summarised as follows: *"More effective services, savings in time and money, and increased growth and employment will result from adopting a coherent European framework of guidance and actions to foster cross-sector and cross-border interoperability and use of location information in e-Government, building on INSPIRE"*.

The 'Establishment of a European Union Location Framework' (EULF) is an Action under the European Commission's Interoperability Solutions for European Public Administrations (ISA) programme¹, which supports interoperability solutions, sharing and reuse among European Public Administrations through the creation of frameworks, architectures and re-usable components to enable more cost effective e-Government services and support cross-border applications. The EULF delivers the location framework that underpins this broader vision, and consists of a series of outputs and actions to improve interoperability and the use of location information in e-Government services, based on five focus areas:



Policy and strategy alignment: a consistent EU and Member State policy and legislative approach where location information plays a significant role.



e-Government integration: making location a key enabler in G2B, G2C and G2G e-government processes and systems.



Standardisation and interoperability: adoption of recognised geospatial and location-based standards and technologies, enabling interoperability and reuse.



Return on investment: ensuring funding of location-related investments is value for money and delivers benefits for government, businesses and citizens.



Effective governance and partnerships: effective decision making and collaboration on location-related activities, involving all relevant stakeholders.

The EULF Blueprint is one of the key outputs of the EULF². Other key outputs are:

- **'EULF Strategic Vision'** - a shared vision and rationale for a European Union Location Framework, and defines the scope, governance and implementation approach;
- **'Assessment of the conditions for an EULF'** - an assessment of the state of play in the different focus areas of the EULF and the need for EULF action in these areas;
- **'EULF References'** - inventories, links and supplementary information related to the EULF;

¹ <http://ec.europa.eu/isa/>

² All EULF deliverables can be downloaded from the ISA website or Joinup: http://ec.europa.eu/isa/actions/02-interoperability-architecture/2-13action_en.htm; <https://joinup.ec.europa.eu/community/eulf/home>.

- **'EULF Studies'** - assess the feasibility of EU action in various policy areas, involving the sharing and reuse of location information;
- **'EULF Pilots'** - create location interoperability solutions in various policy areas (e.g. transport, marine and energy) applying and informing EULF best practices in solving real-world problems.

The EULF Blueprint consists of an Overview – this document - and a series of separate more specific Guidance documents and tools. The EULF Blueprint Overview defines a series of recommendations in the five focus areas, how the recommendation might be adopted, and the rationale for following the recommendation. The Guidance documents and tools provide more detailed guidelines, methodologies and/or good practices with regard to these topics. While the EULF Blueprint Overview is targeted at decision makers and project managers at EU and national levels, the Guidance documents and tools are especially relevant for project managers and practitioners.

The EULF Blueprint Overview is organised as follows: For each focus area, the 'current state' assessment and 'future state' vision are outlined, as described in the EULF Strategic Vision. The key points are then expanded into a series of recommendations (**what?**), with a checklist of associated actions (**how?**), rationale (**why?**), target audience (**who?**) and potential problem areas to address in implementing the recommendations (**risks**). References are also made to relevant EULF Best Practices and sources of further information, including relevant detailed EULF guidance (**more**).

Annex II to the document shows role-based methodologies for the main intended users of the document, i.e. policy makers, e-government service owners, managers and implementers, ICT managers and developers, Data managers, INSPIRE data publishers, and private sector entrepreneurs / developers. These methodologies indicate the relevant recommendations that should be considered in undertaking the typical tasks for each of these roles.

The EULF Best Practices are existing initiatives and applications in different domains demonstrating the benefits of a consistent use and integration of location information and services in e-Government. An overview and short description of the EULF Best Practices is provided in Annex III, with references to the recommendations they demonstrate. These Best Practices are described in more detail in Factsheets available on the ISA website.

Policy and Strategy Alignment

1.1. Assessment and Vision

Current State: Location aspects within existing policy and strategic frameworks are often addressed in inconsistent and incompatible ways. This can result in less effective policies, and in duplication of effort and unnecessary costs. Data of suitable quality is not always readily accessible. There are some good examples of simple, consistent licensing and access to open data but there is limited alignment across Member States.



Future State: An aligned and coordinated policy and strategic approach across Europe for the use of location information that enables more efficient and effective integration of cross-sector and cross-border location-based applications, reducing costs and increasing social and economic benefit. Public sector location policies promote accessibility and interoperability. There are simple and consistent approaches to licensing, progressive open data policies that balance the needs of data users and suppliers, and authentic registers in which 'location' has a prominent role.

1.2. Recommendations

Recommendation 1: Location information and e-government strategies should be fundamentally connected in all legal and policy instruments

How:

- e-Government and ICT strategies should include a key role for location information and technologies, to deliver better e-government services supported by an overall interoperable ICT framework
- Location information strategies should address the requirements of e-Government, supplying data for digital public services and supporting links between the public sector and society. The location information strategies should consider the broad requirements of e-Government and not just the restricted context for which location information might be collected in the first place.
- Location information strategies should be aligned with ICT strategies, in terms of the architectures and technologies used
- Location stakeholders should be involved in the development of the e-Government and ICT strategies
- Stakeholders connected with electronic public service provision should be involved in the development of location strategies
- There should be clear and agreed allocation of tasks and responsibilities between the different parties involved in e-Government, ICT and location information policies
- Different thematic policies should apply a consistent approach to the provision and use of location-related information, for example in their references to standards, use of codes, and reliance on authentic data. The following aspects of policy alignment should be considered:
 - Alignment across different policies in the same thematic area
 - Alignment with European (e.g. INSPIRE) and national location policies
 - Alignment with European (e.g. PSI) and national data policies (see Recommendation 2 below)
 - Alignment of potential e-Government and ICT solutions with European (e.g. ISA, e-Government Action Plan) and national e-Government and ICT policies
- A useful tool for assessing alignment (and other factors) in the development of EU policy is the ICT Assessment Method, which considers firstly whether ICT (including location information and technologies) is important in a particular policy

<p>and, secondly, if it is important, examines the potential options in the use of ICT and provides conclusions and recommendations.</p> <ul style="list-style-type: none"> • ICT assessments may also be undertaken as part of the monitoring and evaluation phase to review the implementation of policies. For EU policies, these take the form of 'evaluations' of particular policies (e.g. INSPIRE) and 'fitness checks' of particular policy domains (e.g. Environment) • The EU Better Regulation 'Toolbox' provides a series of relevant best practice 'policy' tools, including those mentioned above.
<p>Why:</p> <ul style="list-style-type: none"> • Core location information (e.g. address data) is relevant to most e-government services and broader location-based information is important in many e-government services (e.g. land registration) and in public sector information provided to citizens and businesses (e.g. location of schools and hospitals) • Optimising the use of location information helps to deliver innovative, authoritative and comprehensive digital public services • Silo thinking in policy development can lead to duplication and inefficiency, poor value for money, confusion for stakeholders, and overall reduction in policy effectiveness. The potential impacts are felt by businesses and citizens as well as across the public sector • A connected strategic approach will help align implementation actions for mutual benefit, contributing to achievement of goals around growth and better services
<p>Who:</p> <ul style="list-style-type: none"> • e-Government policy makers • ICT policy makers • Thematic policy makers planning digital services or use of data with a location context • Location information policy makers
<p>Risks:</p> <ul style="list-style-type: none"> • Lack of understanding by policy makers of the potential role of location information and how the information should be managed. For example, the EULF Marine pilot highlighted requests from different directives related to the same location information without defining a common strategy for data sharing and management • Complexity in consultation and coordination involving all relevant stakeholders • Keeping pace with the changing political and policy landscape • e-Government strategies focus too much on ICT rather than public service needs • Location information and e-Government strategies involve the private sector to an increasing extent. This presents challenges as well as opportunities that need to be handled consistently, e.g. the conditions for use of private sector data alongside public sector data.
<p>More:</p> <ul style="list-style-type: none"> • UK Location Strategy • UK Government Digital Strategy • GIDEON: Key geo-information facility for the Netherlands • Country Report of Sweden to UN-GGIM 2015 • Finnish National Spatial Data Strategy 2016 • EULF References • EU Better regulation Toolbox • ICT Assessment Method

Recommendation 2: Location information policy should be integral to, and aligned with, wider data policy at all levels of government

How:

- When developing the approach to ensure consistency and alignment between location policy and wider data policy, include key topics such as data sharing, open data, authentic data, data licensing (including reuse), IPR, privacy, data protection and the ethical and professional handling of data
- Ensure that location information is a prominent feature of policies and actions in areas where it can make an important contribution, e.g. open data, authentic data, data licensing and re-use
- Location information should play a significant part of the European data infrastructure envisaged using Cloud services and supporting the goals of the Digital Single Market Strategy
- There should be a common data governance approach for all public sector data, determining how data are collected, managed, used and made available by public authorities
- Location information stakeholders should be involved in the development of broader data policy and vice versa
- The role of public-private partnerships and crowdsourced data should be determined and applied consistently across all data policy (including location data policy)
- There should be a clear and agreed allocation of tasks and responsibilities between the different parties involved in general data policy and location information policy

Why:

- Location information is key public data and much public policy has a location context
- Location information has particular requirements that need to be considered in formulating wider data policy
- It is important to avoid contradictions between location information policy and broader data policy
- Authentic location data is costly to maintain and this needs to be recognised in wider data policy decision making
- A connected strategic approach will help align implementation actions for mutual benefit
- Public-private partnerships and crowdsourcing of data can support sustainability and reliability goals and ensure real needs are met

Who:

- Location information policy makers
- Government data policy makers

Risks:

- Lack of understanding of the specifics of location information by general data policy makers
- Data policy fails to take into account the cost of collecting and making available location data of sufficient quality
- Location policy continues to be seen as “special” and fails to align with wider data policy where it is feasible to do so

More:

- [UK Government Licensing framework for Public Sector Information](#)
- [UK Government Service Design Manual – Open Data](#)
- [UK National Information Infrastructure](#)
- [UK Public Data Group](#)
- [UK Location Council Annual Reports](#)
- [Denmark: Good Basic Data For Everyone – A Driver for Growth](#)
- [Planning for Socio Economic Impact – Open data as a policy instrument in the Netherlands and elsewhere](#)
- [INSPIRE Empowers Re-use of Public Sector Information](#)
- [Open Government Data for Citizen engagement in Managing Development](#)
- [Data infrastructures supporting the European Digital Single Market Strategy, April 2016](#)
- [European Automobile Manufacturers Association: Principles of data protection in relation to connected vehicles and services, September 2015](#)

Recommendation 3: Public administrations should comply with data protection principles as defined by European and national law when processing location data.**How:**

- Appoint a responsible person for data protection – Data Protection Officer (DPO) – to supervise the management of personal location data and provide transparency within the organisation and towards data subjects.
- Ensure DPOs are aware of the scenarios for use of location data within the organisation and the potential data privacy risks
- Ensure lawful processing of personal location data and that the processing of personal location data is fair – individuals may not be deceived or misled – and is transparent in relation to the data subjects.
- Apply data protection and take into account privacy from the start of the developments by data controllers and data processors.
- Apply data minimisation to ensure that only adequate and relevant location data is collected and processed.
- Limit the time data is stored to the strict minimal required.
- Assess the risks for data subjects when data is exposed and their location data processed. Also, perform periodic privacy risk assessments to guarantee an accurate level of data protection towards the data subjects.
- Secure adequately the processing of personal location data:
 - There are security control frameworks such as ISO 27018 for data protection but also more general frameworks such as the ISO 2700x family, ISF Standard of Good Practices, NIST or SANS publications that can help.
 - Notify data breaches to data subjects and relevant bodies. Supervisory authorities and data subjects expect to get notified of data breaches. They should be informed personally and without undue delay.
- Set up a governance structure and data management programme for location data protection which includes:
 - Developing a data protection strategy in-line with the organisation's strategy.
 - Put together a data protection team with a DPO.
 - Implement data protection policies, standards and guidelines.
 - Define activities to raise awareness on data management, risk management, incident management, audit and compliance.
 - Implement processes and systems to automate the task of governance compliance.
 - Define metrics to measure the effectiveness of your data protection

<p>programme.</p> <ul style="list-style-type: none"> • Create trust with data subjects. Be transparent and open with regard to data collection, processing, security, and privacy measures applied: <ul style="list-style-type: none"> ▪ Publish a privacy notice that describes how the organisation collects, uses, retains and discloses what personal data is collected, how the data is used, what technical security measures are in place to protect personal data, with whom the data is shared, how a data subject can access or rectify personal data, and contact information of the DPO. ▪ Require informed consent from customers and users on the use of their personal data. ▪ Have a contact point for data subjects where they can direct their enquiries. <p>Note:</p> <ul style="list-style-type: none"> • The recommendations listed above are a summary of <i>SC246-D3.2 EULF guidelines on location privacy</i>. This document contains more detailed guidance for public administration on location privacy.
<p>Why:</p> <ul style="list-style-type: none"> • Compliance with data protection and privacy law is mandatory. There is a risk that without adequate provisions to protect personal data, there will be a breach of national or European data protection and privacy laws. • The protection of personal data is a fundamental right. Users of public services expect their rights to be protected and public administrations have an obligation to put in place the necessary protections. • Without clear and appropriate data protection procedures, there is a risk in not being able to deal adequately with crisis situations such as systematic unlawful use of personal data or major data leakages. • A governance framework focusing on privacy allows organisations to better implement privacy related principles and respect personal data protection in all processes. Furthermore, according to the General Data Protection Regulation each public administration shall appoint a Data Protection Officer. The DPO and his team allows for supervision of (location) data processing, implementation of the data protection strategy, and creates trusts towards data subjects.
<p>Who:</p> <ul style="list-style-type: none"> • Data Protection Officers • Privacy and security managers • Project Managers • Management Boards (who should appoint and give authority to DPOs)
<p>Risks:</p> <ul style="list-style-type: none"> • Although the laws relating to data protection are clear, it is not always obvious that a geographical context to the data presents a personal data threat • The use of mobile apps is increasing immensely and mobile phones are often seen as the channel of choice by users. Public authorities are making more of their services available through mobile apps. However, the fast pace of industry development and the sophistication and openness of many of the devices, creates vulnerabilities. Furthermore, almost all devices enable a user's location to be identified. Public authorities need to implement the same protections and protocols for user authorisation as the leading commercial mobile apps. • To have a complete 'protection without sharing' approach can result in lost opportunities. As in the commercial world, the release of personal data can benefit users of public services. In the same way that users of internet retail sites may feel they benefit from targeted marketing (others may not of course), there

can be similar advantages for users of public services, e.g. to take advantage of energy subsidies they may not otherwise know about.

- Introducing personal data protection presents extra considerations and efforts for all projects. Also, the drive towards more 'open government data' and more data sharing between administrations, raises more situations where privacy risks need to be considered.

More:

- [General Data Protection Regulation \(GDPR\)](#)
- [EU Agency for Network Information and Security \(ENISA\): Privacy, Accountability and Trust – Challenges and Opportunities](#)
- [EU Agency for Network Information and Security \(ENISA\): Privacy and Data Protection by Design – from policy to engineering](#)
- [EU Agency for Network Information and Security \(ENISA\): Privacy by Design in Big Data](#)
- [EULF guidelines on location privacy](#)
- [UK Information Commissioner's Office : Privacy by Design Guidelines](#)
- [The Location Forum: Location Data Privacy – Guidelines, Assessment & Recommendations](#)
- [ISO/IEC 27018:2014](#)
- [ISO/IEC 27001 - Information security management](#)
- [ISF Standard of Good Practices](#)
- [NIST](#)
- [SANS](#)

Recommendation 4: Effective location-based analysis should play an important role in evidence based policy making

How:

- Use data and statistics based on underlying data as evidence to inform policy making and determine policy outcomes, including location-based data, where relevant
- Take account of national variations to establish a balanced approach when formulating EU policy
- Take account of regional variations or variations by other geographic characteristics (e.g. urban/rural contexts, risk exposure atmospheric pollution, noise and flooding in different locations) to establish a balanced approach when formulating national policy
- Use standardised administrative and statistical units, together with other geographically-related definitions in evidence gathering
- Use relevant location-based evidence in ex-ante impact assessments, ongoing reporting of policy implementation, and ex-poste policy evaluations of EU and national legislation
- Use maps to "communicate the message" and make the policy analysis easy to understand, including evaluating existing data and assessing policy options
- Ensure reference data semantics and standards are consistently applied, to support accurate and comprehensive assessments and help drive decision making
- Consider both 'hard' and 'soft' evidence in informing policy. 'Soft' evidence could come, for example, from interviews, focus groups or social media data capture (e.g. location-based information from mobile phones)
- Target scientific research funding towards key policy topics, giving due weight to the value of location-based research
- Take account of the opportunities with INSPIRE for EU-wide analytical

comparisons based on harmonised location-related data
<p>Why:</p> <ul style="list-style-type: none"> • Geographic differences are a fact of life and should be taken into account in policy formulation, either in establishing an overall approach balancing geographic variations or in developing “differential” policy that specifically targets regional differences (e.g. regional development policy) • Geography influences demographics and demographics are important in assessing policy instruments
<p>Who:</p> <ul style="list-style-type: none"> • EU policy makers • Member State national and local policy makers • Government scientists supporting policy makers
<p>Risks:</p> <ul style="list-style-type: none"> • Policy processes are complex with multiple factors involved and often gaps or inconsistencies in data and information (particularly in ex-ante stages). A holistic understanding is needed, taking account of relevant risk factors. There may be trade-offs to take into account in affected policy areas. These issues are particularly important in relation to environment policy and related policy areas, e.g. transport, industry, energy, health • Simplistic extrapolations based on geography and demographics can be misleading • Maps can be used to hide the real connections or make un-related connections, so the underlying analysis needs to be sound
<p>More:</p> <ul style="list-style-type: none"> • EU Environmental status of marine waters • Making the most of our evidence: a strategy for Defra and its network • Sustainable Development Goals in the Netherlands - Building blocks for environmental policy for 2030 • GIS and Evidence-based Policy Making, ed. Stephen Wise, Max Craglia • Do Place Based Policies Matter, Federal Bank of San Francisco • Place Based Policies, Oxford University School for Business Taxation • The Case for Evidence Based Policy, Policy Horizons Canada • United Kingdom Crime Statistics • EULF Marine Pilot, creating a Marine SDI framework for Marine Strategy Framework Directive e-reporting • Italian National Landslide Warning System
<p>Recommendation 5: Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement</p>
<p>How:</p> <ul style="list-style-type: none"> • Apply the procurement rules specified in the new EU Directives on Public Procurement <ul style="list-style-type: none"> ▪ Directive 2014/23/EU on the award of concession contracts ▪ Directive 2014/24/EU on public procurement ▪ Directive 2014/25 EU on procurement by entities operating in the water, energy, transport and postal service sectors.

- Use electronic procurement processes and tools for more effective management of the procurement process, including pan-European e-procurement tools, such as e-PRIOR, the European Single Procurement Document (ESPD) Service and e-CERTIS.
- Make appropriate references to INSPIRE and other relevant standards (e.g. thematic standards) in procurement documents
- When referring to INSPIRE:
 - Refer to the INSPIRE Directive, its Implementing Rules and Guidelines in a very precise way
 - Refer to INSPIRE as a method for data specification development or apply some of the technical specifications of INSPIRE, even if certain activities covered by the Call for Tender do not – strictly speaking – relate to INSPIRE.
 - For geoportals or data portals accessing location data, reference may be made to the use of INSPIRE data and services but not to any INSPIRE requirements for geoportals (they do not exist). To say “the geoportal should be compliant with the INSPIRE Directive” does not make sense.
 - Clarify the terminology used in the procurement documents and how these relate to the terminology used in INSPIRE
 - Refer whenever possible to existing architecture documents describing the National/sub-National SDI, INSPIRE or e-Government architecture in which the requested components fit.
 - Allow room for flexibility by not only referring to standards and specifications that are already adopted, but also to ongoing work.
- When including conformity requirements:
 - Be clear about which outputs/products of the procurement should/must be conformant/compliant with which specification/standard.
 - Require testing of the outputs/products on conformity/compliance as part of the procurement.
- When referring to international standards:
 - Be as complete and precise as possible when referring to International standards.
 - If necessary, refer to a series of standards that go together, rather than to individual standards.
- Ensure location assets being procured are interoperable and reusable
- Ensure procurement addresses relevant geospatial skills as well as data or software solutions
- Include these location-specific requirements in the selection/evaluation criteria
- If necessary, employ INSPIRE/standards specialists in the procurement or follow-on implementation to ensure appropriate standards-based approaches are followed
- Check the European Catalogue of ICT Standards for Public Procurement, under development

Why:

- It is important to have a transparent and uniform procurement approach to ensure fully effective competition following procurement best practices
- Suppliers should be given a clear steer on what is needed from them and how they will be evaluated. This will result in more relevant proposals and reduce the risk of delivery failure / change requests.
- Legal requirements (e.g. INSPIRE) need to be followed
- Avoid additional burdens or unnecessary expenditure in re-inventing the wheel or re-working solutions
- Electronic procurement makes for more effective procurement processes

Who:

- Public sector ICT/geospatial procurement officers
- ICT managers and architects responsible for procurement of geospatial technologies or solutions involving geospatial technologies
- Providers of public services using external resources or products
- Developers of e-Government and SDI/INSPIRE strategies
- Wider government policy makers.

Risks:

- Lack of understanding of what is relevant to specify in procurement documents on location standards / INSPIRE
- Supplier evidence may be lacking in early stages of INSPIRE implementation
- Specifying that particular standards will be followed doesn't guarantee that they will be followed or that solutions will be functionally or even technically proficient. Parallel functional requirements are needed in procurement. Oversight of solution delivery is needed during implementation to ensure what is promised is what is delivered.

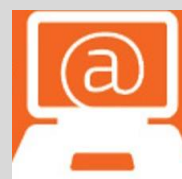
More:

- [Ciciriello, C. \(2014\). OpenPEPPOL e-Procurement in Europe. OpenPEPPOL AISBL: Brussels, Belgium](#)
- [European Commission \(2013\). Guide for the procurement of standards-based ICT-Elements of Good Practice. Commission Staff Working Document. European Commission: Brussels](#)
- [Janssen, K. \(2009\). The EC legal framework for the availability of public sector spatial data: an examination of the criteria for applying the directive on access to environmental information, the PSI directive and the INSPIRE directive. Elsevier: Amsterdam](#)
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- Study on best practices for ICT procurement based on standards in order to promote efficiency and reduce lock-in: [Analysis of Survey Results](#), [Final Report](#)
- [European Union Location Framework Guidelines for Public Procurement of Geospatial Technologies \(2016\), Vandenbroucke, D et al.](#)
- [European Catalogue of ICT Standards for Public Procurement](#)

E-Government Integration

1.3. Assessment and Vision

Current State: Location is key to effective public services but location information is not well integrated in e-Government processes, resulting in sub-optimal services, incompatible systems and expensive maintenance. Location-related services are often designed and implemented from a provider rather than a user perspective, resulting in services and information that may not be fit for purpose.



Future State: Location is well integrated in e-Government processing supporting G2G, G2B and G2C interactions, through location related services across government. Users do not have to supply the same mandatory information multiple times. There is visibility of common coordinating and support structures, expert groups and technologies, a strong user voice in the design, evaluation and improvement of location-based services, and good evidence of take-up of services.

1.4. Recommendations

Recommendation 6: Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions.

How:

- Create an inventory of key e-government processes and services and determine in which location information plays a significant role
- Analyse opportunities for improving e-government services and processes in their use or potential use of location information, through internal analysis (e.g. using BPMN), external analysis (e.g. customer insight techniques) or external comparison (e.g. benchmarking examining best practices in other Member States or other administrations in the same Member State)
- Establish improvement programmes in priority areas where location information can be used more effectively in e-Government services and processes
- Look for quick wins to demonstrate progress
- Establish and publicise 'model implementations' to encourage wider take-up of good practice
- Look elsewhere nationally and in other MS to identify good practices that can be re-used
- Introduce methods of continuous assessment, to help in planning and delivery of incremental improvements, identify new factors that need to be considered, and ensure interoperability is maintained over time as location-enabled services and solutions evolve

Why:

- Location information underpins many public services but is not always used in the most effective and efficient ways
- To reduce administrative burdens and deliver better services with optimal use of location information, accessed via digital channels whenever appropriate
- Such action will help realise the value of location data in e-Government services

Who:

- Public service owners and implementers
- ICT developers and system integrators building and delivering ICT components of e-government services

- Private sector organisations looking to provide innovative services through public-private partnerships.

Risks:

- Better use of location information is only one aspect of public service improvement
- Investment in other areas may be more cost effective
- Services cannot always be considered in isolation. There are basic elements involving location information that cut across multiple services, e.g. addresses, buildings information, transport information

More:

- [Future Proofing e-Government for a Digital Single Market, 2015](#)
- [United Nations e-Government Survey, 2014: Chapter 2 Progress in Service Delivery](#)
- [E-Government for Better Government, OECD, 2005](#)
- [Location aware solutions for healthcare, Cisco](#)
- EULF process use case, traffic accident monitoring
- [E-Government: Using technology to improve public services and democratic participation, European Parliamentary Research Service, 2015](#)
- [e-Government: The need for effective process management in the public sector](#)
- EULF Transportation Pilot: a model implementation in the ITS domain, that can be followed by other countries.
- EULF Energy Pilot, Use Case 1: extending the NL best practice of mapping energy performance certificates.

Recommendation 7: Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties.

How:

- Publish newly created or modified INSPIRE data using INSPIRE services and ensure data is discoverable in thematic, national, and EU catalogues and portals
- Consider all relevant legislation relating to data sharing, including data protection, when seeking to implement a cross-sector or cross-border location enabled service
- Establish an INSPIRE implementation timetable, taking into account priorities for use of the data as well as the legislative timetable
- Make use of INSPIRE data where it exists and contribute to the 'pool' of INSPIRE data where relevant
- Consider extensions to INSPIRE if appropriate to the thematic area / services being planned. Refer to the relevant INSPIRE Thematic Working Group(s) and related communities when considering extensions to INSPIRE in order to exploit and share the extensions with EU and National communities and to support the maintenance of INSPIRE.
- Integrate INSPIRE and non-INSPIRE data in discovery portals to establish a "whole government data" approach
- Re-use best practice tools to publish and use INSPIRE data, e.g. tools for:
 - Metadata creation and publication
 - Portal implementation
 - Data transformation
 - Visualisation
 - Licence creation

<ul style="list-style-type: none"> ▪ Data discovery ▪ View and download services • Consult relevant organisational, national and EU experts and resources in publishing and using INSPIRE data • Use the INSPIRE geoportal to discover and access pan-European INSPIRE data • Pilot implementation of INSPIRE based solutions in collaboration with other MS to engage in collective learning, and pave the way for EU wide roll out
<p>Why:</p> <ul style="list-style-type: none"> • 'Location' is a key integrating factor for a lot of public sector data • Although INSPIRE was introduced for environmental policy reasons, it contains data themes that are relevant to other policy areas and related public services (e.g. addresses, cadastral parcels, transport networks, protected sites, buildings). • It is important to build the INSPIRE 'critical mass' to support both known and unknown uses (optimising the benefits of the SDI) • INSPIRE publication is a long term consideration involving large numbers of public authorities and individuals. It is essential that the process is organised in a structured and efficient way • INSPIRE provides 'authoritative' data and data models that can be used for public services • INSPIRE supports cross-border harmonisation of data making cross-border public services and data portals easier to establish and operate
<p>Who:</p> <ul style="list-style-type: none"> • e-Government service owners and implementers • Data and geographic information specialists • Coordinators of INSPIRE, wishing to disseminate best practice
<p>Risks:</p> <ul style="list-style-type: none"> • Lack of understanding of INSPIRE <ul style="list-style-type: none"> ▪ Perceived complexity of INSPIRE and lack of awareness of the benefits ▪ Implementing INSPIRE compliant data and metadata requires an effort that is not always perceived. It means changing the way people usually work with their data, involving potential additional effort in duplication, maintenance, sharing, documentation, training and procurement ▪ In either case the ROI is unclear • Silo thinking, ignoring benefits of wider data sharing, interoperability and reuse • Extending INSPIRE can increase complexity in use and maintenance • Poor quality metadata, making data difficult to find and creating problems in deciding on use • Poor quality data in relation to the intended use. Contributing factors may include: <ul style="list-style-type: none"> ▪ INSPIRE does not require the publication of new data. The intended use of data may require new data; ▪ In the early stages of INSPIRE implementation, data does not have to be compliant with the specifications; ▪ Data may be lost in transforming to INSPIRE ▪ Cross-border differences may be difficult to reconcile due to different interpretations of the INSPIRE specifications • Data may be needed before it is mandated in the INSPIRE regulatory roadmap • Data may be mandated in the INSPIRE roadmap but is not seen as a priority by users of the data • 'Quick and dirty' geodata may be more relevant than 'authoritative' geodata
<p>More:</p>

- [INSPIRE Community website](#)
- [INSPIRE Geoportal](#)
- [INSPIRE roadmap](#)
- [ARE3NA Re3ference Platform: INSPIRE Publication Tasks](#)
- [Considerations in using INSPIRE data](#)
- [INSPIRE Thematic clusters website](#)
- [Guidance and tools for implementation of INSPIRE in the UK](#)
- [GIM International, INSPIRE Boosts Spatial Data Sharing](#)
- [MSFD Working Group Data, information and Knowledge exchange \(DIKE\)](#)
- [EULF Marine Pilot website](#)
- [EULF INSPIRE marine pilot – D1.2. Analysis of requirements that link INSPIRE and MSFD](#)
- [EULF INSPIRE marine pilot – D2.0. MSFD spatial data requirements mapped to INSPIRE data Models](#)
- [EULF INSPIRE marine pilot - D4.2. EMODnet and INSPIRE: benefits of closer collaboration and a framework for action](#)

Recommendation 8: Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled.

How:

- Use the three phases for collaborative development of e-Government services - design, implement, evaluate and monitor – defined in the European Commission publications: '*Collaborative Production in e-Government*' and '*Analysis of the value of new generation of e-Government services*'.
- **Design phase:** the following collaborative service design principles should be taken into account:
 - **Stakeholder engagement** by organising workshops, surveys, interviews, focus groups and other forms of collaboration.
 - **Ask early feedback** by sharing ideas, concepts, source code and any other relevant artefact as soon as possible so that engaged parties can provide feedback.
 - **Release early and frequently** to reduce risk in service design. This enhances mutual learning and usually improves quality.
 - Adopt **user-centric design principles** for e-Government services, based on needs and views of users, for example:
 - Create a service that is simple and intuitive enough that users succeed first time;
 - Give users a single point of contact for the service, rather than passing them around different parts of government;
 - Ask users of e-government services once only for location-related information. For example, users should not be required to resubmit their address data for each service when it has already been registered with government;
 - Requested location information should be relevant and proportionate to the needs of the service and the associated legislation;
 - Location-based e-government services should use the preferred electronic channels of citizens, e.g. mobile channels. They should be optimised for mobile use;
 - Public administrations should respect the legitimate 'location privacy' of citizens and businesses (see recommendation 3) and should not compromise their security through unchecked sharing of location-related

information. The approach should aim to increase businesses' and citizens' confidence in the way public administrations are handling their location information;

- **Create and communicate the process for collaboration** so that stakeholders know how and to which extent their input will be taken into account. As an example, **The UK Government Service Design Manual** contains guidance and resources to understand the needs of the consumer of e-Government services. The Manual is tailored to different profiles like designers, developers, researchers, analysts, architects, etc. Make use of **Working Groups**. For example, ISA developed a '**Process and methodology for developing core vocabularies**' which includes among others the use of collaborative tools that are publicly available.
- **Implementation phase:** ensure that implementation and operation of the service maintains the user and collaborative focus of the design phase:
 - Put in place a **sustainable multidisciplinary team** to design, build and operate the service, led by a service delivery manager
 - Deliver the service by ensuring that collaborators can reuse the service or data in their processes. **Service chaining (choreography) and orchestration** are key to manage the process flow:
 - Standards such as the **Universal Description, Discovery and Integration** (UDDI) can facilitate service chaining and orchestration of services. UDDI is a protocol that includes a registry by which organisations can list themselves on-line and allow for third-parties to register and locate web service applications.
 - **Electronic Business using eXtensible Markup Language** (ebXML) includes XML-based standards sponsored by UN/CEFACT and OASIS and allows reuse of (electronic) business and location information by all collaborators.
 - Test the end-to-end service with all participants and parts of government in an environment identical to the live service, including all common types of browsers and devices. If possible, involve users who have contributed in the design phase. If required, conduct usability testing with other potential users outside the input group to validate the design.
 - Ensure contingency plans are in place for initial service introduction (e.g. peaks in certain processes) and potential service disruption
- **Evaluation phase:** openly measure and evaluate the performance of e-Government services:
 - **Analytics** can reveal how e-Government services are actually being used and how users respond to variations in service design. Similarly, key performance indicators like usage statistics or service delivery costs can help make better decisions on improving services. For example, **Gov.uk Performance** makes this information publicly available to promote transparency and accountability.
 - Carry out ongoing **user research** and **usability testing** to continuously seek feedback from users to improve the service

Note:

This model assumes that public authorities take responsibility for service delivery as well as the ICT associated with the service. The ICT may be produced in-house or with the help of private sector companies. However, it must first be determined whether public authorities should deliver the service, i.e. that the service is part of the public task. There, there are other models that may be adopted, for example:

- The private sector may be well-placed to offer a particular service or a sufficiently

similar service without the need for significant intervention from the public sector (i.e. it is in their commercial interests to offer such as service and their commercial interests coincide with the public interest).

- Public authorities may collect data through a particular process or service and decide to make the data openly available for external parties to develop their own products and services. In this case, the external parties (e.g. private sector companies) should be engaged openly to inform them and to assess their potential interest in using the data. Actions to tailor the data to external needs may be part of the eventual public sector process. This option is also a contributor to growth objectives (see Recommendation 15).
- Public authorities may scale back their role in existing service delivery when they can rely on alternative models. For example, the UK Department for Transport operated a national multi-modal journey planning service for several years. The data was subsequently made available as open data so that developers could build their own services. Finally, a public / private partnership called Traveline was developed that operates the service, including publication of open data, on a not-for-profit basis without public funding (see Best Practice 21).
- Governments may encourage 'civic hacking' to develop new ideas, technologies or methodologies to help solve civic problems and improve the lives of citizens (this is a form of participatory government, often involving the use of public data, that has had some successes).

Why:

- Having an open and collaborative methodology and communicating it openly to all involved parties increases stakeholders' buy-in and participation since it starts from the needs and requirements of the users.
- Public services are about 'serving' the public (i.e. businesses and citizens) who pay taxes to help in paying for these services. Businesses and citizens should therefore have a say in what these services look like.
- There is an expectation from taxpayers that different parts of government will share information they provide and act in a coordinated and efficient way.
- Asking for feedback at an early stage of development together with frequent releases ensures quick user feedback, incremental improvement, and reduces the risk of building a service that does not meet users' requirements.
- Working groups with experts from public administrations, academia, and the industry can help to build consensus when developing e-Government services and tackle difficult challenges.
- Business process standards can help formalise process and (location) data flow of services and collaboration opportunities using service chaining and orchestration to facilitate the implementation and collaborate on services.
- Evaluating and monitoring e-Government services help public administrations improve future releases of the service.

Who:

- e-Government service owners and implementers
- Providers of ICT and outsourcing services to public authorities
- Project managers, designers and developers

Risks:

- If public administrations do not make an effort to develop and apply open methodologies for collaborative e-Government design they risk developing e-Government services that do not meet stakeholders' requirements, especially if stakeholders are not included early in the design process.
- Difficulty in obtaining the 'voice of the customer' when it comes to public services.

Introducing an open collaborative approach gives voice to those wanting to participate and not necessarily those whose needs may be met by a collaborative approach to e-Government.

- The wishes of citizens and businesses may conflict with government policy needs, which are often about control, rules, taxes etc.
- There is a risk in overcomplicating the data collection and reporting process under the guise of 'policy compliance'
- Legacy systems often make repeat requests for data and possibly use different standards and formats, and channels that are difficult to integrate
- There may be gaps in skills (digital divide) that limit participation and use of digital services. This possibility needs to be managed in the process.
- Required changes may not be affordable.
- The time required to develop a service may be so long that, when the service is ready to use, it is obsolete. A faster way to develop services should be adopted.
- If government relies on the private sector to deliver 'services', there is a risk that the public interest may not be (fully) supported.

More:

- [Collaborative Production in eGovernment - SMART 2010-0075, Tech4i2 Ltd, \(2012\)](#)
- Analysis of the value of new generation of eGovernment services - SMART 2014-0066, (2015), European Commission, PwC, Open Evidence, Institute for Baltic Studies
- [UK Government Service Design Manual](#)
- [Rethinking e-Government Services – User Centred Approaches, OECD](#)
- [Electronic Business using eXtensible Markup Language](#)
- [ISA Programme - process and methodology for developing core vocabularies](#)
- [Taxonomy of Open Government Services](#)
- [Universal Description, Discovery and Integration](#)
- [UK Performance Dashboard](#)
- [Traveline](#)
- [Civic hacking](#)
- [Example of citizens' participation to shape European eGovernment services](#)
- [EULF e-Government Service Design Guidelines](#)

Recommendation 9: An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government.

How:

- Member States should create and maintain an accurate and up-to-date knowledge base of where their citizens and businesses are located. This will make the collection of census and other statistical data as straightforward as possible.
- Member States should have a common geospatial reference framework for statistics to enable timely, accurate and efficient production of location-based statistics. This should be based on geocoded registers of administrative units, addresses, buildings and dwellings and use consistent and persistent identifiers to reference relevant information. The geospatial reference framework for statistics should be based on INSPIRE to enable the widest possible collation of harmonised data.
- Member States should have mechanisms to enable frequent ('dynamic') collection of statistical information taking account of this 'location' knowledge.
- Opportunities should be taken to streamline and improve statistical data

<p>collection, taking into account new sources of information, such as social media, web analytics etc.</p> <ul style="list-style-type: none"> • The spatio-temporal dimension of statistics should be captured in a format so that it can be readily used in a GIS for geostatistical analysis, with consistent geo-reference data and other consistent coding to enable it to be analysed at different geographic / administrative levels. • The geospatial reference framework for statistics should form the basis for the collection of census data, including supporting dynamic census data collection. • To support the production of statistics and census information, it is important to understand the origin, production process and other aspects of the quality of geospatial data. INSPIRE metadata should be used as the basis for this documentation. • Public authorities should apply analytical techniques (customer analytics) to help improve public services. For example, Transport for London uses 'big data' analysis of vehicles, vehicle location, traffic information and payment cards to reveal patterns or trends and enable action to be taken.
<p>Why:</p> <ul style="list-style-type: none"> • Much statistical data has a geospatial component • The techniques and mechanisms used nationally and in different policy areas for location-based data collection and analysis are not sufficiently well integrated to support pan European or cross-domain analysis and comparisons • The cost of collection and integration of location-based statistical data inhibits the timeliness and extent of analysis that can be undertaken, inhibiting the potential value of the policy evidence base. • Geospatial information combined with statistics underpins evidence-based policy making and political decisions at all levels in government. • Periodic monitoring of geographically-related indicators over time is a typical requirement for many EU Directives, e.g. the Marine Strategy Framework Directive, being addressed by the EULF Marine Pilot. • With a common geospatial framework policy makers in public administrations will be able to combine different methods of location-based data collection to inform their policy decisions, including census data, transaction data, social media information etc.
<p>Who:</p> <ul style="list-style-type: none"> • EU and Member State statistical authorities • EU and Member State policy makers
<p>Risks:</p> <ul style="list-style-type: none"> • Too much data and not enough information – there is so much data that can be collected and analysed, with risk of hiding or missing the message • Drawing conclusions based on location may be too simplistic to determine appropriate interventions • Establishing a common basis for analysis and comparison in multiple geographies and domains is very challenging
<p>More:</p> <ul style="list-style-type: none"> • "Integration of statistical and geospatial information – a key ESS priority", Eurostat keynote, at meeting of UN-GGIM expert group on integration of statistical and geospatial information, May 2015 This document highlights a number of significant use cases, for example: <ul style="list-style-type: none"> ▪ Ensuring access to emergency hospitals in Europe ▪ Accessibility to schools in Portugal

- Where establishing new wind power could be worthwhile in Germany
- Catchment areas of European airports to ensure proper return on investment
- Access to green infrastructure in Sweden
- Access to public transport in urban areas in Europe
- Preventative measures in a crisis situation caused by the climate in Denmark
- Adaptation to climate change in Europe
- [New Frontiers for Official Statistics, Eurostat](#)
- [Geospatial analysis at Eurostat](#)
- [Sweden: How Geospatial Statistics can Measure Climate Change](#)
- [Sweden: Benefits from data sharing - increased use of geospatial information in the statistical production process](#)
- [INSPIRE data specification for statistical units](#)
- [Transport for London Big Data for a Better Customer Experience](#)
- [Statistical geography in Australia](#)
- [Location enabled census in Poland](#)

Standardisation and Interoperability

1.5. Assessment and Vision

Current State: Several standardisation bodies are working on standards in the geospatial field. Also various cross-cutting and thematic standards exist at an international level. These standards can be interpreted and implemented in different ways resulting in incompatible ways of managing and integrating location information. Compliance to existing legislation (notably INSPIRE) helps, but does not guarantee, the creation of harmonised pan-European or cross-border products, including core data sets. Current governance and funding models leave gaps in relation to the interoperability arrangements required for the creation of EU-wide core data.



Future State: Core data has been defined and a funding model has been agreed for its ongoing maintenance and availability. Consistent use of geospatial and location-based standards and technologies, enabling interoperability and reuse, and integration with broader ICT standards and technologies, including the standards and solutions promoted by the ISA programme. Use of these standards in all areas related to the publication and use of location information in e-Government services, including metadata, discovery, view, exchange, visualisation etc.

1.6. Recommendations

Recommendation 10: Public administrations should adopt a common architecture to develop e-Government solutions, facilitating the integration of geospatial requirements.

How:

- Design the architecture of the e-Government service by taking into account the four interoperability layers defined by the **European Interoperability Framework (EIF)**: legal, organisational, information, and technical. The EIF also provides underlying architectural principles to consider when designing the service-oriented architecture (SOA). These principles should be applied when defining the architecture of the location-enabling e-Government service.
- Use an approach based on **Service-Oriented Architecture (SOA)** for web services such as those specified within INSPIRE. SOA enables a system of building blocks and ensures re-usability, modularity and flexibility of the service.
- Use the **European Interoperability Reference Architecture (EIRA)**, a content meta-model and reference architecture focused on interoperability between public administrations. The EIRA expands on the interoperability levels of the EIF. It provides architecture building blocks for each layer together with a common terminology. Furthermore, it uses a SOA-based approach in-line with the EIF.
- Consult the **EULF Architecture and Standards for SDI and e-Government** document. This document uses the **Reference Model for Open and Distributed Processing (RM-ODP)** to describe architecture and standards for Spatial Data Infrastructure (SDI) and e-Government. It provides information on how e-Government relates to assets from SDIs and **INSPIRE**.
- Use a recognised common modelling language such as **Archimate**, an open and independent modelling language for enterprise architecture that is supported by different tool vendors.

Note:

- The recommendations above provide examples of architecture approaches and

methodologies. Other **relevant architecture frameworks and methodologies** can be used in combination with the EIF and EIRA such as: TOGAF, DYA, GERAM, Nolan-Norton or Zachman's framework.

Why:

- Adopting a common interoperability framework and reference architecture ensures that interoperability is addressed, especially when there is the intention to reuse existing solutions. In this respect, the EIF and the associated EIRA define interoperability in a holistic manner, by taking into account all relevant layers: legal, organisational, information and technical.
- The lack of a common architecture and common terminology on location information can lead to divergent and difficult-to-integrate location information systems. INSPIRE provides a common architectural approach for cross-sector and cross-border e-Government solutions involving location information.
- Service-oriented architecture provides flexibility, modularity, scalability, improved information flow and encourages re-usability of services.
- The EIRA implements the four interoperability layers of the EIF and provides further scoping, common terminology and re-usable architecture building blocks to develop service-oriented architectures and services. By using a common terminology, it will be easier for public administrations to integrate location information when developing e-Government services. Common terminologies allow to achieve a minimum level of coordination by providing a set of well-defined architecture building blocks.
- The "EULF Architecture and Standards for SDI and e-Government" report complements the EIF and the EIRA and provides additional information on how they relate to each other and how INSPIRE fits into the overall architectural framework.

Who:

- Enterprise Architects
- Solution Architects

Risks:

- The application may be (largely) standalone and considerations of wider architectural conformity may be an overhead.
- Different public administrations may have different architectural standards making cross-administration interoperability difficult, particularly in a cross-border context.
- Integration may be required with legacy systems that were not built using today's architectural principles.
- The EIRA and EIC are not yet fully proven and embedded in EU-wide architectural planning for e-government systems.
- More amenable people and administrations might share their solutions but these might not be the best solutions.

More:

- [European Interoperability Framework v2](#)
- [European Interoperability Reference Architecture](#)
- [EULF Architectures and Standards for SDI and e-Government](#)
- [INSPIRE Network Services Architecture](#)
- [INSPIRE Data Specifications: Generic Conceptual Model](#)
- [Archimate modelling language](#); and [Archi tool](#)
- [Belgium's MAGDA SOA Platform](#)

Recommendation 11: Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible.

How:

- **Use an online catalogue of re-usable technical solutions.** The European Commission maintains a **catalogue of re-usable technical solutions** on Joinup. It includes solutions that facilitate geolocation integration and the implementation of the INSPIRE Directive. The solutions are centred around communities of interest such as:
 - The **Community of Interoperable Solution Repositories (CISR)**: a community that brings e-Government professionals together to disseminate good practices on sharing and re-using ICT solutions. The CISR community can provide an entry point into the Joinup catalogue of solutions.
 - The **ARE3NA community** holds a list of interoperability solutions in the geospatial and e-Government domain in line with the EIF interoperability layers and the tasks associated with the publication and re-use of INSPIRE data and services.
- Before developing new ICT systems or e-Government services, it is recommended to check whether there are existing solutions that could be reused. Public administrations are developing repositories where such information can be found. For instance, the European Commission has developed the **European Interoperability Cartography (EIC)**. Here, it is possible to find highly reusable and interoperable solutions modelled using the EIRA, including location data and technical standards. New re-usable location interoperability solutions that are created should be catalogued in the EIC, so that others may benefit from them or help contribute to their improvement.
- Use **authentic data registers and data services** to ensure that the location information part of the e-Government service is trusted and authentic and avoid duplication of data and related management processes ("collect once, use many times"). Authentic data registers and data services are essential building blocks that can include important location datasets and data for various domains. Some examples of data registers providing access to trusted data are:
 - [The INSPIRE registry](#)
 - [Stelsel van basisregistraties](#) (System of basic registration)
 - [European Pollutant Release and Transfer Register \(E-PRTR\)](#)
- **Use persistent unique identifiers when reusing location data solutions.** Using common unique identifiers for the same data (spatial and non-spatial) allows unambiguous references to the same resources over time. They provide a long-lasting globally unique reference to a digital resource, applicable to all uses and potential uses of the data. The European Commission Joint Research Centre (JRC) has developed guidance on governance of persistent identifiers to be used in Spatial Data Infrastructures.
- Persistent unique identifiers can also be used to **connect data that was not previously connected** and support analysis relating to the connections between the data, e.g. between health and location. These data juxtaposition techniques have their history in studies such as John Snow's analysis of cholera deaths in London, pointing to drinking water from a particular pump, through to more formalised relational modelling techniques in use from the 1970s, and more recently linked data and associated technologies that support increasingly open ended applications.

Why:

- Carrying out a re-usability check reduces the risk of isolated ICT development.

- Online catalogues provide lists of re-usable solutions and standards. These catalogues provide access to solutions that have undergone a reusability assessment and that are mature enough to be reused.
- Engaging with communities of interest, such as those on Joinup, and re-using solutions from other public administrations can help public administrations share best practices and receive guidance when developing ICT solutions.
- Authentic data registers and common data services can help maximise the potential for reuse of data since they offer common, trusted sources of information.
- Using existing single sources of authentic data, data services and relevant technical solutions reduces the development, maintenance and operating costs of new solutions (in terms of integrating data sources). This helps to focus on more value-adding tasks instead of 'reinventing the wheel'.
- Using single sources of authentic data improves data quality, assuming these sources are managed properly.
- Using single sources of authentic data increases the potential for interoperability between administrations and for providing a more efficient service to users.
- Persistent identifiers ensure that data resources are more visible and connectable. Furthermore, they promote semantic interoperability.

Who:

- Location information policy makers
- ICT developers
- Solution architects

Risks:

- Required data quality may come at a price that is not affordable
- The existing single authentic data source may not be fit for purpose in relation to a particular new requirement – i.e. it may be too complex, too simplistic, have data gaps etc.
- There may be many legacy systems operating off different isolated data that make the transition to single data sources difficult to justify and manage in a reasonable timeframe.
- Location data is usually combined with other data in e-government services, both multi-purpose data (e.g. citizen data) and thematic data (e.g. energy usage). To get the fullest benefit of a cross-government authentic data strategy requires a clear business case, very strong backing and an intensive delivery programme. Denmark, for example, has been successful with its Basic Data Programme. Such a programme would be more challenging in countries with much larger populations and areas. Governmental structures can also be part of the challenge.

More:

- [Joinup catalogue of solutions \(filter for location\)](#)
- [European Interoperability Cartography](#)
- [CISR Community](#)
- [ARE3NA community](#)
- [Governance of Persistent Identifiers to be used in Spatial Data Infrastructures](#)
- [Persistent identifiers](#)
- [John Snow's cholera study](#)
- [Relational data modelling](#)
- [Linked data](#)
- [EC Sharing and Reuse Framework](#)
- [European legislation on reuse of public sector information](#)

Recommendation 12: Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services.

How:

- Be actively involved in **standardisation activities** relevant to your Geospatial Information (GI) and e-Government communities.
- Use **open standards** – where possible – to reduce the risk of ICT vendor lock-in. There are catalogues of recommended open standards both at national and international level that help identifying existing solutions. Examples include: OGC catalogue service, the Dutch Government Open Standards Catalogue and the German SAGA. To know more about interoperability initiatives at Member States level the European Commission developed the National Interoperability Framework Observatory (NIFO) factsheets.
- Apply the **INSPIRE** implementing rules and technical guidelines to put in place an EU-wide, cross-sectoral interoperability framework for location information facilitating its integration in e-Government processes and services.
- Expand the application of INSPIRE with other geo-standards elaborated at international level (W3C, OGC, OASIS...) and European level (Copernicus, EIF, CEN TC/287...). This allows to link the use of geo-standards to relevant general ICT and e-Government standards. Examples of geospatially relevant standards that are not covered by INSPIRE are: sensor (observation) services, quality services, and notification, alert & feedback services.
- Take up the Internet of Things (IoT) – and related standards – as it will rapidly increase the availability of sensors and tools to share and process big (geospatial) data that becomes relevant for e-Government applications.
- In all of the above considerations regarding standards, ensure the implementation applies the standards in the simplest possible way to reduce complexity and cost, whilst maintaining the aims of interoperability and re-usability.
- Use Business Process Model and Notation (**BPMN**) to design and describe business processes and the Business Process Execution Language (**BPEL**) to execute the described processes using services.
- Next to standards, public administrations should also be aware of the Linked Data paradigm and its technical specifications that can be considered as an important enabler for the integration of geo-spatial and non-geospatial information using URIs and RDF. The application of Linked Data principles and technology supports INSPIRE implementation and can be seen as a complementary approach for exposing INSPIRE assets providing some flexibility. For example, the European Commission has already developed **Core Vocabularies** in the context of the ISA programme. They are data specifications created in an open process with expert groups and endorsed by ISA Member State representatives. Next to Core Vocabularies there are also metadata schemas such as **ADMS-AP**, **DCAT-AP** and **GeoDCAT-AP** that help to connect related data that wasn't previously linked.

Why:

- Active participation in GI and e-Government communities improves alignment of specifications and helps administrations maintain awareness on technological innovation.
- Open standards facilitate interoperability and data exchange. They help reduce ICT vendor lock-in and promote fair competition.
- Standards are used to shape ICT solutions. If existing standards are not applied, ad hoc design decisions may be taken that are relevant to the solution in question but less applicable in the wider context. These ad hoc design decisions may result in long term interoperability issues when integrating with other ecosystems in the future and thus higher costs.

- The EU INSPIRE Directive sets out binding implementing rules and technical guidelines in a number of specific areas (metadata, data specifications, network services, data and service sharing, and monitoring and reporting). They ensure that spatial data infrastructures of the Member States are cross-border compatible.
- Catalogues of ICT open standards are centralised online catalogues that contain commonly agreed standards for different domains. They help public administrations identifying standards that, for example, could be included in public procurement.
- Using BPMN and BPEL can be useful to define where spatial data input is needed, processed, and generated in e-Government processes.

Who:

- Data specialists
- Data policy makers
- ICT developers

Risks:

- The standards world moves slowly and is continually evolving. This means that sometimes it lags behind or is not yet ready in the context of a particular new application. Standards evolve with the evolution in technology. Legacy systems are built on legacy technologies and standards. This sometimes means that it is difficult to justify and make "one more major upgrade" or to integrate new and legacy systems.
- Standards are often a "middle ground" agreed by specialists over a number of years. Hence they might not always be a perfect fit for a particular new application.
- System and data integration require common standards such as those promoted by INSPIRE. With so many public authorities and countries involved, there is an immense implementation challenge to achieve harmonisation. However, the steps are being taken to make this happen in a coordinated way, underpinned by the legislation.
- The return on investment for linked data depends on a degree of harmonisation which is difficult to achieve, with a multiplicity of data, different data and quality standards, and in many cases, a lack of legislative and policy support.

More:

- [INSPIRE](#)
- [NIFO factsheets](#)
- [Core Location Vocabulary](#)
- [ADMS-AP](#)
- [DCAT-AP](#)
- [GeoDCAT-AP](#)
- [Framework of standards for the Dutch SDI](#)
- [The Dutch Government Open Standards Catalogue](#)
- [France: e-Government interoperability standards, including geospatial standards](#)
- [ISA Programme](#)
- [EULF Use Case on Traffic Accident Monitoring](#), applying BPMN as a means of assessing where improvements can be made to processes and services in the use of location data

Return on Investment

1.7. Assessment and Vision

Current State: There are inefficiencies in collection, publication and use of location information and growth opportunities with increased availability of re-usable data. There is insufficient understanding of the usefulness and value of location information. Infrastructure investments, such as INSPIRE or SDIs, are difficult to justify and there is limited evidence of actual benefits. However, some specific examples do spell out the value of investment in key datasets or particular applications. Funding models are not always clear particularly where many parties contribute to and derive benefit from the infrastructure. Only some procurement refers to INSPIRE and, when it does, it is not always clear what this means.



Future State: There is a strategic approach to national and European funding, procurement, and delivery of location information and location-based services to minimise costs and maximise benefits for government, businesses and citizens, recognising best practices, and building on INSPIRE and standardisation tools. The funding and sourcing model for collection and distribution of core location data takes into account user needs from different sectors and the strategic importance of continued supply of data at a suitable quality. Procurement recognises INSPIRE and other standardisation tools in a meaningful way. There are compelling impact assessments and business cases, a rigorous approach to targeting and tracking benefits, and good evidence that benefits are being achieved.

1.8. Recommendations

Recommendation 13: Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities.

How:

- Apply a location-enabled e-government monitoring approach that looks at:
 - The available **components** (technological and non-technological) for enabling the availability and access to location data and services
 - The **e-services** and processes that have integrated location data and web services
 - The **use** (take-up) of these location enabled e-services by public administrations, businesses and citizens
 - The financial and non-financial **benefits** of using location data and services
- Use the indicators that are included in the INSPIRE monitoring and reporting obligations, e.g.:
 - Existence, accessibility and conformance of data, metadata and network services
 - Use and benefits of data and network services
- Define a list of 'basic services' to identify what can be expected to be implemented and measure / benchmark location-enabled e-government development against this list. Use a 'basic services' list which addresses all basic e-government services, with a balanced contribution of those involving location information.
- For identifying and monitoring the benefits of location information, it is important to focus on the benefits of the use and especially the integration of location data

<p>and services in (e-Government) processes of public administrations, as this is where the benefits are most visible and tangible. The identification of the benefits of integrating location information in processes can be done at different levels. Benefits can be measured: 1) of one single location-enabled service that is provided in the process (in comparison with a traditional service) to support a G2C, G2B and/or G2G interactions, 2) of the entire location-enabled processes (in comparison with the traditional processes), or 3) of several processes within a policy action or policy domain. Moreover, it is important not to look, not only at the benefits for government, but also to take into account the benefits for citizens, businesses and other parties and even broader socio-economic benefits.</p> <ul style="list-style-type: none"> • Benchmark the performance measurement with other MS to understand the relative degree of maturity and identify where good models may be found for future service improvements.
<p>Why:</p> <ul style="list-style-type: none"> • Understanding the extent, use and value of location enabled e-government services enables the value of the investment to be determined and also helps target further investments • Comparisons with other MS can help in identifying opportunities for re-use and collaboration
<p>Who:</p> <ul style="list-style-type: none"> • e-Government policy makers • Location information policy makers • Investment analysts
<p>Risks:</p> <ul style="list-style-type: none"> • Tendency of monitoring and benchmarking in the context of e-government to focus on the main upstream activities of the value chain (readiness and availability), while the downstream elements (use and impact) are neglected because of the difficulty of finding this information • Indicators can sometimes be difficult to measure, with information provided too vague, general or abstract. Involve professional investment analysts to validate indicators
<p>More:</p> <ul style="list-style-type: none"> • European Commission e-Government Benchmark Framework 2012-15 • United Nations e-Government Survey 2016 • INSPIRE Monitoring and Reporting web page

<p>Recommendation 14: Communicate the benefits of integrating and using location information in e-Government services.</p>
<p>How:</p> <ul style="list-style-type: none"> • Use 'strategic' investment approaches, such as macro-economic analysis to assess overall market impacts, including effect on GDP of effective approaches to geospatial information management. • Prepare 'project' business cases taking into account the potential benefits of an integrated approach to the use of location information in e-government services, using this information to inform investment decisions for particular services. • In all impact assessments / business cases, it is essential to state the

<p>assumptions underlying both costs and benefits. If these are stated, future outcomes can be compared against them and adjustments made where relevant.</p> <ul style="list-style-type: none"> • Collect evidence on how the integration of location data and services can help public administrations improve their processes and achieve benefits. Measure benefits of particular investments to validate projected outcomes and make the case for further / continued funding. • Use real life case studies and user stories to highlight benefits in a way that is understandable • Ensure the communication addresses the understanding and motivations of the target audience, e.g. whether they are policy or technically focused • Communicate benefits using factsheets, web based documentation, videos etc. • Run e-government 'communication' events involving citizens and businesses
<p>Why:</p> <ul style="list-style-type: none"> • Clear metrics provide powerful messages • Strategic 'infrastructure' investments often require a different type of analysis to more straightforward 'project' investments. • Communication of benefits supports investment and demonstrates to tax payers that public administrations are spending their money to good effect • A business case investment approach based on evidence complements the evidence-based policy approach. No longer is government about backing 'political' measures without the necessary evidence. • User stories and examples of benefits are simpler to understand and more meaningful to most people than detailing the process followed, parties involved or technology used
<p>Who:</p> <ul style="list-style-type: none"> • e-Government policy makers • Location information policy makers • Investment analysts
<p>Risks:</p> <ul style="list-style-type: none"> • Tendency of monitoring and benchmarking in the context of e-government to focus on the main upstream activities of the value chain (readiness and availability), while the downstream elements (use and impact) are neglected because of the difficulty of finding this information. • Indicators can sometimes be difficult to measure, with information provided too vague, general or abstract. Involve professional investment analysts to validate indicators. • Impacts of new services or service improvements can be difficult to predict. This is why ongoing monitoring and targeting of improvements is needed. An interactive approach to service delivery and improvement (see recommendation 8) can also be beneficial.
<p>More:</p> <ul style="list-style-type: none"> • Relevant benefits studies: <ul style="list-style-type: none"> ▪ Putting the US Geospatial Services Industry on the Map, Boston Consulting Group 2012 ▪ The Value of Geospatial Information to Local Public Service Delivery in England and Wales, 2010 ▪ The Value of Spatial Information to the Australian and New Zealand Economies, ACIL Tasman 2008/09 ▪ What is the Economic Impact of Geo Services? - a report prepared by Oxera for Google, 2013

- [Assessing Social Benefits in Sweden](#)
- [INSPIRE Benefits: Guide for Data Publishers, UK 2014](#)
- [Costs and Benefits of Implementing the INSPIRE Directive Workshop, 2012](#)
- [Estimating Benefits of Spatial Data Infrastructures: A Case Study on e-Cadastres, 2012](#)
- [Finnish INSPIRE benefits study](#)
- [INSPIRE in Danish e-Government, 2012](#)
- [The Economics of Public Sector Information, Pollock 2009](#)
- [Review of Recent Studies on PSI Re-use and Related Developments, Vickery 2011](#)
- [OECD Working Paper on "Open Government Data: Towards Empirical Analysis of Open Government Data Initiatives"](#)
- [The Value of Danish Address Data, 2010](#)
- [The financial benefits of open basic data in Denmark](#)
- Typical benefits for government and best practice examples are as follows (see Annex III for best practices):
 - Cost and time savings (Netherlands, redesign of spatial planning process – EULF Best Practice 6)
 - Simplification of processes (Italy, building permit process simplification – EULF Best Practice 20)
 - More effective policy making (Belgium, Germany and UK, better informed economic policy through local business knowledge base – EULF Best Practice 3)
 - Increased collaboration and coordination (Germany, Netherlands and Belgium, Euregio Meuse-Rhine business locator – EULF Best Practice 12)
 - Improved quality of processes (Poland, census data collection and management – EULF Best Practice 17)
- Typical benefits for government and best practice examples are as follows (see Annex III for best practices):
 - Cost and time savings (Netherlands, cables and pipelines database – EULF Best Practice 13)
 - Better service delivery (Poland, improved emergency response – ELF Best Practice 8)
 - Delivery of new services (Belgium, Germany and UK, provision of up-to-date and accurate information on local businesses – EULF Best Practice 3)
 - Public transparency (Belgium, air quality information – EULF Best Practice 14)
 - Public participation (Netherlands, consultation in spatial planning – EULF Best Practice 6)
- Examples of wider socio-economic benefits are as follows:
 - Creation of new companies (Flanders, generic GIS for e-Government – EULF Best Practice 1)
 - Business relocation and growth (Germany, Netherlands and Belgium, Euregio Meuse-Rhine business locator – EULF Best Practice 12)
 - Value added business services (Czech Republic, Base Register of Territorial Identification, Addresses and Real Estates (EULF Best Practice 11)
 - Improved emergency response (Italy, landslide warning system – EULF Best Practice 7)
 - Flood risk awareness raising (Germany, zoning system for floods, backwater and heavy rains – EULF Best Practice 10)

Recommendation 15: Public administrations should facilitate the use of their location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth.

How:

- Actively promote the availability of location data and web services to companies, research institutions, citizens and other interested parties
- Make the process of searching, finding and accessing these data and web services as easy as possible, through for example:
 - Creating data portals merging location data and non-location data, so data needs can be satisfied in one search;
 - Using standardised metadata for describing location and non-location data;
 - Consider broad potential uses of the data beyond the primary users, when describing the data resource and specifying metadata;
 - Complementing general search facilities with “specialist” search, e.g. thematic portals, extended metadata, to cater for more specialist needs;
 - Simplified and consistent data licensing using standard government-wide terms and conditions for re-use of data and services, both spatial and non-spatial, based on generally recognised approaches, e.g. Creative Commons;
 - Clearly defined licensing for access to data which has been derived from third party sources (often a sticking point in access to thematic location data which is linked to authentic reference location data);
 - ‘Open data by default’ or ‘maximised access to open data’ if not the default, with access to public sector data free of charge and without any reuse restrictions or conditions;
 - Free ‘evaluation licences’ for public sector data that is ultimately chargeable;
 - ‘Freemium’ licensing models to distinguish between free and non-free access to datasets, giving free access to, for example, lower resolution datasets, and chargeable access to higher resolution datasets.
- Take a strategic approach to funding public sector location reference data (i.e. data that acts as a spatial reference to other data) alongside the funding of other important public sector authentic datasets, e.g. citizens, businesses, property ownership, including consideration of innovative funding models, to promote the widest possible benefit from such investment
- Public administrations should actively support private, non-profit and academic actors in the development of new products and e-services through, for example:
 - Establishing ‘innovation labs’ or ‘innovation hubs’ to foster new business developments using public sector data
 - Promoting open data policy in government and brokering access to this data through hackathons, open challenges to government
 - Incorporating non-government actors in the governance framework for public sector data, so that their demands and views are heard
 - Setting up testbeds, as a tool to provide different types of user access to services, tools and applications that still are under development. Testbeds make it possible to experiment with new technologies and to test and validate these new technologies in a ‘safe and controlled’ environment. An important benefit of testbeds to private companies is that they make it possible to take into account these new technologies in developing their own products and services
 - Setting up pilot projects, in which different stakeholders (public organisations, companies, researchers, etc.) collaborate in exploring, developing, testing and implementing new technological developments. The goal of such projects is to share existing knowledge, ideas and experiences on new technological

<p>developments, to stimulate people to further experiment with these new developments and to determine an integrated approach.</p> <ul style="list-style-type: none"> ▪ Providing companies and other non-governmental actors the opportunity to add their data and services to the public sector (spatial) data infrastructure, where they are compliant and relevant, providing a wider audience for their products and services. ▪ Taking into account the needs and requirements of businesses, research institutions and other (potential) users in the further development and implementation of INSPIRE/SDI. This means also non-governmental actors and organisations are invited to participate in user requirements analyses and in defining and describing use cases. ▪ Demonstrating best practice examples of how private companies, citizens, academic institutions and other users make use of INSPIRE/SDI data and services to provide new or improved products and services. This can be linked to an award competition focusing on the best practices. ▪ Providing training in the skills needed to exploit public sector location data, use it in developing e-government solutions, and in creating new commercial products and services. <ul style="list-style-type: none"> • Public administrations should take specific action to facilitate companies from other countries wishing to establish operations or do business in their country, for example by: <ul style="list-style-type: none"> ▪ Non-restrictive tender qualifications ▪ Working with other countries on shared information sources for new businesses (see EULF Best Practice 12) ▪ Reducing red-tape in registration of new businesses ▪ An inclusive approach on promotion of innovation ▪ Supporting the appointment of multi-national consortia on government funded projects to obtain the right skills ▪ Supporting multiple languages where appropriate in relevant documentation and services.
<p>Why:</p> <ul style="list-style-type: none"> • These actions help improve the “free flow of data”, a key objective in the Commission’s Digital Single Market Strategy • Public sector data is a valuable asset on which added value products and services can be built • Governments are increasingly open to sharing their data but there are still too many restrictions in discovering the right data and accessing this data easily • There are inconsistent models in data licensing across European public administrations • There are proven studies in the contribution of government open data to growth, with geographic datasets being cited as some of the more important data
<p>Who:</p> <ul style="list-style-type: none"> • e-Government policy makers • Data policy makers • Location information policy makers • Policy makers responsible for business innovation and growth • Public data providers
<p>Risks:</p> <ul style="list-style-type: none"> • Businesses or citizens may not be aware of the possibilities that access to government location data may offer or have the capabilities to exploit the

improved availability of this data. In accessing data, potential users may firstly have difficulties in finding the appropriate catalogue. Secondly, when they do find the catalogue, it may be difficult for them to find the right dataset for their needs, even though it appears in the catalogue. This is because data publishers may fail to provide good search parameters for their data or the catalogues may not have good quality search algorithms.

- Access to 'high value' location datasets, capable of supporting the broadest opportunities, may be more limited than access to other datasets.
- Access to public location data may be subject to 'unavoidable' restrictions, e.g. existing commercial arrangements with suppliers, personal privacy concerns associated with the data.
- Although the benefits of open data may be recognised, the cost of making such data available free of charge may be restrictive.
- Providing open access to high value government data may compromise the commercial position of certain players in the market.
- Free data still needs to be funded. If funding levels drop due to reduction or removal of income from licensing of data or data services, then quality may be compromised as a result.
- Different countries may have significant investments in different data standards, making harmonisation difficult to justify, even with the impetus of INSPIRE
- Sharing technology and data doesn't necessarily create business value and growth. There needs to be relevant business and commercial acumen and innovation to build the new data businesses of the future.
- The broadest capabilities come from existing players in the market who can afford to pay for their data.
- Product cycles are increasingly short and governments are too slow moving to match this pace of change.
- Governments may want to develop data services that are more appropriately placed in the private sector.
- The wider business environment, including wider government policy, may inhibit business growth, regardless of actions taken to provide access to data. This includes, for example, the tax regime, availability of capital, employment policy, policies on establishment of businesses from other countries etc.

More:

- [European Commission Priorities: Digital Single Market – bringing down barriers to unlock online opportunities](#)
- [European Commission plan to digitise European Industry, 2016](#)
- [Denmark Basic Data Programme: Good Basic Data for Everyone – a driver for growth and efficiency](#)
- [UK: Open Data Institute](#)
- [UK: National Innovation Plan public consultation](#)
- Matched funding models: e.g. [Innovate UK](#), [EU PCP and PPI funding](#)
- [UK: Government Service Design Manual – Open Data](#)
- [UK: DATA.GOV.UK - Apps](#)
- [Socio-economic benefits of Danish open address data](#)
- [GeoAlliance Canada: How can a clear identity for the geomatics sector lead to economic growth?](#)
- [Australian Government National Innovation and Science Agenda](#)
- [OECD Study on Public Sector information and Content](#)

Effective Governance and Partnerships

1.9. Assessment and Vision

Current State: Good practices in strategic 'location' governance exist in some Member States, linked with wider governance of e-service delivery. However, there are cases where different interests are not resolved coherently, key stakeholders are left outside the decision process, and network vs central approaches are not well balanced (e.g. in collecting and combining data in a particular domain). Often the partnering model for the exchange of location information is not well defined or understood, and the benefits to stakeholders are not well articulated. Collaboration may exist for specific purposes but wider considerations are not addressed. It is difficult to develop services that cross organisational boundaries, particularly where costs incurred by one organisation have a downstream benefit to others. Knowledge and skills mainly exist with geospatial experts. There is low awareness of the opportunities and issues in using location information outside this community, and few examples of geospatial experts sharing their knowledge convincingly with broader stakeholders.



Future State: There is high level support for a strategic approach to the funding and availability of location information at Member State and EU level, based on INSPIRE and other tools to achieve interoperability. Effective governance, partnerships, work programmes, responsibilities and capabilities to progress such an approach have been established, taking into account the needs and expectations of stakeholders at Member State and EU level. Governments recognise the importance of 'location' understanding and skills and invest in awareness raising, training and resourcing. Service design takes account of user capabilities. Specialists form communities to share knowledge and develop new ideas related to location information. As a result, there is a sufficient level of understanding and skills to develop, deploy and use effective location-based services.

1.10. Recommendations

Recommendation 16: Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal.

How:

- Recognise the potential contribution of different types of actors, and optimally make use of the competences, knowledge and experiences of different partners.
- The involvement of many different partners requires an approach to create and maintain effective partnerships between these partners.
- The key to success is to bring together and unify different parties around a common goal or problem to be solved. In some cases, the basis for cooperation might be a legal obligation or a political decision. Also, the need to provide better or even new services to citizens and other actors might be a good incentive to collaborate.
- Integrating the use of location information effectively in e-government is a long term continuous process that needs constant attention and occasional renewal.
- INSPIRE and open data policies have been used as drivers for integration but the legislative and political obligations of these policies should not be seen as goals in their own right but rather as an opportunity to gain political and financial support to improve service delivery or decision making.
- Once consensus has been established amongst the different actors, a more project management-oriented approach can be followed, determining well-defined

goals that will be realised through an agreed sequence of activities. An important instrument within such a project management approach is the instalment of a small but efficient project task force with representatives from the different parties. In many of the EULF Best Practices such a task force or coordination group was established.

- Over time, public administrations should adopt a flexible approach for governing the relationships and dependencies between different actors, drawing on a combination of different governance mechanisms as appropriate. Initially, more network-oriented forms of governance may be appropriate. When private actors are involved, more market-oriented forms of governance will be appropriate to manage the relationships with them. More hierarchal forms of governance, with agreed roles and responsibilities of different actors may be needed to formalise and guarantee over the long term the commonly agreed principles and decisions.
- The type of governance often depends on how money is approved and flows and whether the governance is operating at the policy level, the programme level or both. If the governance body is managing a budget, decisions will naturally be focused on where and how that money is spent and whether investments are delivering what was intended. Strategic or policy decision making will operate at a different level but should also take account of the implementation feasibility and impact of decisions that have been taken.
- Governance needs to take account of the voice of users of the outputs of the location activities, e.g. businesses, citizens, academic bodies, research institutions. This can be done through a number of means, including communications events, consultations, and including "users" in the formal governance arrangements through the establishment of a User Group, Business Forum etc.
- Specialist governance groups may need to be established for particular aspects of the 'location infrastructure', either as location-specific groups or as part of wider ICT-related governance. Examples include groups on data standards, data specifications and metadata, groups to manage persistent identifiers, linked data governance etc.
- Establish an independent chair and independent quality assurance for key location governance bodies to ensure interests are balanced and the group performs effectively

Why:

- The use and integration of location information in public sector processes requires the participation and cooperation of many different actors: not only governments at different levels and/or in different areas, but also private companies, non-profit and academic organisations can contribute to the integration of location information in certain processes, with the aim of providing better services to citizens and other parties.
- Finding a common goal is all about creating a situation in which all parties could benefit. Having a common goal also improves the long-term stability and sustainability of the cooperation.
- Governance needs to be aligned to the types of decisions taken, e.g. strategic, programme, financial, technical

Who:

- e-Government policy makers
- Location information policy makers
- Government data policy makers
- ICT policy makers
- Standards bodies and other technical interest groups
- Users of government location data

Risks:

- Securing the necessary time from key relevant stakeholders in the collective governance, balanced with their other responsibilities
- Covering all interests in the governance arrangements, including balancing 'demand' and 'supply' interests
- Building governance arrangements based on distributed infrastructures involving many stakeholders entails challenges in overall management and guaranteeing everyone's commitments
- Maintaining flexibility in the governance arrangements to cope with the changing status of the work programme
- Keeping the governance fresh and alive, when new ideas and political priorities come to the fore
- Balancing the long term strategic focus and the short term tactical focus

More:

- An interesting analysis of back office integration processes is provided by Bekkers (2007). The governance of back-office integration. Public Management Review. 9: 377–400.
- Examples of common goals that unify different actors:
 - Providing citizens better access to information on contaminated sites (EULF Best Practice 15) or on air quality issues in their region (EULF Best Practice 14)
 - Reducing the time citizens have to wait for a building permit (EULF Best Practice 20)
 - Reducing the risk of accidents during excavations (EULF Best Practice 13)
- [UK Location Council Annual Report 2010/11](#), including governance arrangements
- [The UK Location Programme's approach to benefit realisation and the role of the Location User Group](#)

Recommendation 17: Effective partnering is key to the successful development and exploitation of location data infrastructures.**How:**

- The ground rules of cooperation need to be debated and agreed by the different participants and formalised in an appropriate way, signed by persons of responsibility in the cooperating organisations
- Partnership agreements should be established as early as possible in cross government strategic data programmes, joint initiatives to develop location interoperability solutions, or where different public authorities are involved in the provision of location enabled e-government services. These may include considerations on:
 - Purpose
 - Scope
 - Outputs
 - Service Levels
 - Intellectual property rights
 - Data protection
 - Responsibilities
 - Funding
 - Personnel
 - Timetable

- Governance

- Public private partnerships should be progressed to bring the best of both worlds in the implementation of e-government location interoperability solutions and in the delivery of location enabled e-government services. These can be at a strategic level or in relation to specific projects or services. At a strategic level, partnerships may be established with industry bodies (e.g. groups representing the geospatial, surveying and land management, or insurance sectors) or with key industry players. For specific projects or services, the 'partnerships' may be associated with (long term) framework contracts to support public authorities in delivering ICT or e-government services.
- Multi-national partnerships should be developed to progress common research interests or promote cross-border opportunities involving location data and services
- Examples of different types of partnership agreements include:
 - Multilateral Collaboration Agreement
 - Bilateral Collaboration Agreement
 - Memorandum of Understanding
 - Implementing Agreement
 - Data Sharing Agreement
 - Interoperability Agreement
- The following types of agreement involve more binding elements that can contribute to the partnership:
 - Legal Partnership Agreements
 - Framework Contracts
 - Service Contracts
 - Pre-commercial procurements for R&D services
 - Service Level Agreements
- Building and maintaining a location data infrastructure requires concerted action and cooperation from a large number of organisations (maybe hundreds of public administrations) over a lengthy period of time (the INSPIRE implementation timetable spans 10 years – 2010 to 2020 - and the intended use of the infrastructure doesn't stop there). Such an activity requires a "community" approach, both at a national level (to engage all the relevant organisations around a common purpose tailored to national needs) and EU-wide (to contribute to specifications, share experiences, collaborate on tools etc). Such communities may also be relevant at a thematic level (e.g. the marine and transport sectors have active communities) and in relation to particular technologies, e.g. open source software development communities working on tools for data portals, metadata management etc.
- Partnerships can be long term arrangements. The success of the partnership needs to be evaluated from time to time. Changes need to be introduced into the nature of the partnership, the membership, the priorities for action as needs change and to keep the partnership relevant and performing effectively.
- Partnerships can be set up to lobby government on particular (location) data issues, e.g. in order to get open access to public sector data, to lobby for data to be made available in particular ways

Why:

- The use and integration of location information in public sector processes requires the participation and cooperation of many different actors: not only governments at different levels and/or in different areas, but also private companies, non-profit and academic organisations can contribute to the integration of location

<p>information in certain processes, with the aim of providing better services to citizens and other parties.</p> <ul style="list-style-type: none"> • Agreements need to be formalised in an appropriate way and by relevant people for any partnership to be successful. • Even if one party is the central driving force for a location strategy or programme, successful outcomes often depend on multiple parties working together and such an arrangement will stand a better chance of success if these multiple parties have a say in what happens.
<p>Who:</p> <ul style="list-style-type: none"> • e-Government policy makers • Location information policy makers • Government data policy makers • Policy makers responsible for business development and growth
<p>Risks:</p> <ul style="list-style-type: none"> • In establishing public private partnerships, public authorities have to be wary of giving unfair competitive advantage to particular industry players • Participants may be too focused on their own interests rather than the common good • Lead times for getting agreements can be significant, particularly if many parties are involved. This can create inertia and potentially limit or counterbalance the goodwill engendered in initial discussions amongst the parties • Partnerships may reduce their effectiveness over time unless close attention is given to the operation of the partnership and whether it is effective in achieving the commonly agreed goals • Successful communities need constant fuelling in order to maintain interest and momentum. There is a risk that without this, they will not succeed. • Sufficient funding and resource may not be available to maintain the partnership / community. There is a related risk of dependence on particular sponsors or other individuals who may move on to other things.
<p>More:</p> <ul style="list-style-type: none"> • Designing Comprehensive Partnering Agreements, Rotterdam School of Management, Erasmus University • ISA interoperability agreements • INSPIRE Community website • SeaDataNet • MEDIN Marine Environment Data & Information Network • UK Open Government Partnership • Open Knowledge Foundation • GeoNetwork Opensource Community • GEO Alliance Canada • Pan Canadian Geomatics Community Strategy • European Commission ESIF funding partnership agreements • European Commission Joint Research Centre Collaboration Agreements • European Commission Cloud Service Level Agreement Standardisation Guidelines • Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe

Recommendation 18: There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities.

How:

- Promote an understanding of geography and spatial literacy in academic and work environments
- Include effective use of geospatial information systems in schools and university curricula
- Provide awareness training for policy makers to help them understand the value of location-based analysis for evidence-based policy making and the approaches and tools that can be adopted
- Introduce 'digital champions' to promote public sector modernisation through the use of digital technology, and ensure these people are aware of and convey the benefits of geospatial information and technologies. Where an organisation is running a major GI improvement programme, a 'GI champion' may be needed to drive through the changes.
- Include 'spatial' competencies in national ICT and data competency frameworks
- Provide INSPIRE awareness raising and training events for policy makers, (geo) data specialists, and ICT implementers involved in the implementation and use of INSPIRE data
- Recognise relevant geospatial and INSPIRE competencies in the terms of reference for procurements involving geospatial technologies
- Promote the benefits of an integrated approach to the use of location information in e-government and the role of INSPIRE, through communications events, use case factsheets, videos etc (see also recommendation 14)
- Run hackathons and competitions to promote innovation in the use of geospatial technologies and take up of more openly available geospatial data
- Ensure public sector projects introducing geospatial e-government solutions document and publish the learning from these projects, and produce relevant training resources to support rollout and take up of solutions
- Recognise the potential 'digital divide' and 'spatial divide' amongst users of e-government services. Ensure the services are as simple to use as possible, are developed in collaboration with potential users, and have the necessary instructions, training and support for users (see also recommendation 8)
- Reuse existing best practices, tools, and solutions where possible to shortcut implementation, introduce innovation, and reduce the need for specialist skills
- Employ expert quality assurance to avoid mistakes in first time deployment and use of geospatial technologies and data
- Re-use existing geospatial and INSPIRE training resources to support new learning for data specialists and ICT implementers
- Use web based learning tools to share knowledge and ideas, e.g. wikis, blogs, webinars
- Participate in geospatial community groups to gain / share knowledge and communicate with peers (e.g. INSPIRE community, EUROGI, UK Association for Geographic Information, Trentino Open Data community)
- Install and use location-based mobile apps on your mobile phone
- Read specialist books and journals to develop knowledge and keep it up to date

Why:

- Computers and mobile phones are used widely in all walks of life.
- Basic spatial knowledge and understanding of maps is relevant to many everyday

<p>situations but is not always retained or kept up to date from geography learning in schools</p> <ul style="list-style-type: none"> • Location information is relevant in many policy areas but the opportunities afforded and the best way of exploiting these opportunities are not always well known • INSPIRE impacts a wide range of people in public authorities across Europe, and requires awareness and skills at different levels and for different purposes • ICT and data skills frameworks do not always keep up to date with relevant technologies • There are many ways of learning, and different people learn in different ways, e.g. formal education and training, studying publications, work experience, communicating with peers. These different types of learning all need to be factored in to the overall approach. • Project teams disband and move on to other things, sometimes outside the organisation. It is therefore essential that knowledge and learning is captured and retained for future use. • Teams brought together from different organisations and countries can bring a broad perspective of knowledge together to solve particular problems • Communicating benefits and how they were achieved through worked examples is a powerful way of raising awareness raising and learning
<p>Who:</p> <ul style="list-style-type: none"> • Policy makers • (Geo) data specialists • ICT project managers and implementers • Data analysts and statisticians • Business developers looking to create new businesses based on available public geodata • Academia
<p>Risks:</p> <ul style="list-style-type: none"> • Training needs to be relevant to the user and timely for the situation, otherwise knowledge and information is not retained • Open Knowledge (i.e. knowledge sharing) like Open Data requires commitment and resourcing • Policy makers see geospatial information as a technical topic and not a tool for policy related analysis • Projects do not allow sufficient time for training and capturing lessons learnt • Competency frameworks are too general to focus on geospatial or other specialist topics • INSPIRE is seen as too complicated and technical • The number of geography graduates and graduates with geospatial training (i.e. in geography or ICT courses) cannot keep pace with requirements • Industry is relied upon for training but this concentrates knowledge on the supply side when knowledge is needed at all levels • SMEs require business acumen and a supportive business environment as well as technical knowledge and available data to create and run successful (geo) businesses
<p>More:</p> <ul style="list-style-type: none"> • Geography in the National Curriculum for Wales • University College London, Centre for Advanced Spatial Analysis • Nottingham Geospatial Institute • Defra Geography Skills Framework • European e-Competence Framework

- [INSPIRE Forum](#)
- [European Umbrella Organisation for Geographic Information \(EUROGI\)](#)
- [UK Association for Geographic Information \(AGI\)](#)
- [American Geosciences Institute \(AGI\)](#)
- [Open Source Geospatial Foundation \(OSGeo\)](#)
- [UN-GGIM Knowledge Base](#)
- [GeoKnow](#), EU funded project bringing together web-based tools for processing geospatial data
- [EULF Marine Pilot Training Package](#)
- [smeSpire Project / Training Platform](#)
- [Geovation](#), UK promoting and facilitating the use of geospatial data from the Ordnance Survey
- [UK Open Data Institute Open Data Challenge Series](#)
- [ESRI training](#)
- [National Geographic Magazine](#)
- [GIM International](#)
- [Geospatial World](#)
- [Digital champions](#)
- [Towards the Data Driven Economy \(The Gap in Data and Technology Skills\), IDC](#)

Conclusion

This document outlines a series of recommendations for EU and Member States public authorities and people the work with that are involved in publishing and using location information in e-government services. 80% of public sector information has a location content, so these recommendations are relevant to a large part of government activity.

The recommendations are divided into the five focus areas of the EULF, i.e. policy and strategy alignment, e-government integration, standardisation and interoperability, return on investment, and effective governance and partnerships. They cover many scenarios, including publication of location data required by the INSPIRE Directive, collection of data for e-reporting and production of statistics, use of INSPIRE and other thematic data in non-environmental policies, the use of location information in public service provision, as well as making public sector data available to businesses for them to generate new products and services, or to improve the products and services they offer to the market.

Checklists are provided for 'how to' apply the recommendations and what 'risks' are relevant to consider. The target audience for each recommendation is also highlighted. Finally, references are given to where 'more' information can be found.

The EULF Blueprint is a collective statement of 'what good looks like' in the use of location information in e-government. It therefore represents the basis for a maturity model of geospatial information management good practice.

The Blueprint is deliberately structured in the form of checklists to help plan or assess initiatives. It is complemented by detailed guidance on particular topics, where more context and detailed information can be found. EULF detailed guidance documents currently exist for procurement of geospatial technologies, policy alignment in the use of location information, architectures and standards for SDIs and e-government, location-based service design, and location privacy.

The location content of any ICT enabled e-government service is usually only one part of the overall picture. The EULF aligns with the European Interoperability Framework (EIF) being promoted by the ISA and ISA² programmes. It also supports the European Commission Better Regulation, Digital Single Market and Public Sector Modernisation goals.

Technology evolves rapidly as does the political landscape and policy priorities. This Blueprint represents the learning brought together at this point in time, and informed by reference to many other initiatives in the field as well as the EULF pilot projects in different policy areas (marine, transport, energy). It is anticipated that further knowledge will be incorporated in the future but, for now, it represents current collective thinking on best practice.

List of abbreviations and definitions

Abbreviations

ADMS-AP	Asset Description Metadata Schema Application Profile
AGI	American Geosciences Institute
ARE3NA	Reusable INSPIRE Reference Platform
BfS	German Federal Office for Radiation Protection
BPEL	Business Process Execution Language
BPMN	Business Process Model Notation
CEN	Comité Européen de Normalisation - European Committee for Standardisation
CEN/TC 287	CEN Technical Committee 'Geographic Information'
CISR	Community of Interoperable Solution Repositories
CNR	Italian National Research Council
CNR-IRPI	Institute for Geo-Hydrological Protection of the Italian National Research Council
DCAT-AP	Data Catalogue vocabulary (DCAT) Application Profile for data portals
DG	Directorate-General
DIKE	MSFD Working Group for Data, Information and Knowledge Exchange
DPO	Data Protection Officer
DURP	Dutch Digital Exchange of Spatial Processes
DYA	Dynamic Enterprise Architecture
ebXML	Electronic Business using eXtensible Markup Language
EC	European Commission
e-CERTIS	A mapping tool used to identify and compare certificates requested in public procurement procedures across the EU
EIC	European Interoperability Cartography
EIF	European Interoperability Framework
EIRA	European Interoperability Reference Architecture
EIS	European Interoperability Strategy
ELF	European Location Framework
ELISE	European Location Interoperability Solutions for E-government
EMODNet	European Marine Observations and Data Network
e-PRIOR	The European e-Procurement Platform
E-PRTR	European Pollutant Release and Transfer Register
ESIF	European Structural and Investment Funds

ESPD	European Single Procedure Document
EU	European Union
EUROGI	European Umbrella Organisation for Geographic Information
EULF	European Union Location Framework
G2B	Government-to-Business
G2C	Government-to-Citizen
G2G	Government-to-Government
GDV	German Insurance Association
GeGIS	Belgian Generic GIS for e-government
GEO	Group on Earth Observations
GeoDCAT-AP	Data Catalogue vocabulary (DCAT) Application Profile extension for describing geospatial datasets, dataset series, and services
GERAM	Generalised Enterprise Reference Architecture and Methodology
GI	Geographic information or geospatial information
GIS	Geographic information system or geospatial information system
GML	Geography Markup Language
GRM	Geospatial Rights Management
ICT	Information and Communication Technologies
IMIS	German Integrated Measuring and Information System
INSPIRE	Infrastructure for Spatial Information in the European Community
IoT	Internet of Things
IPR	Intellectual Property Rights
IRCE-CELINE	Belgian Interregional Environment Agency
ISA	Interoperability Solutions for European Public Administrations
ISA ²	Interoperability Solutions for Public Administrations, Businesses and Citizens
ISF	Information Security Forum
ISO	International Organisation for Standardisation
ISO/TC 211	International Organisation for Standardisation (ISO) Technical Committee 211 (Geographic Information/Geomatics)
JRC	Joint Research Centre
MEDIN	Marine Environment Data and Information Network
MS	EU Member States
MSFD	Marine Strategy Framework Directive
NIFO	National Interoperability Framework Observatory

NIST	National Institute for Standards and Technology
OASIS	Organisation for the Advancement of Structured Information Standards
OECD	Organisation for Economic Cooperation and Development
OGC	Open Geospatial Consortium
OMG	Open Management Group
OSGeo	Open Source Geospatial Foundation
PCP	Pre-Commercial Procurement
PIDs	Persistent Identifiers
PPI	Public Procurement of Innovative Solutions
PSI	Public Sector Information
RDF	Resource Description Framework
RM-ODP	Reference Model for Open and Distributed Processing
RUIAN	Czech Base Register of Territorial Identification, Addresses and Real Estates
SAGA	Standards and Architectures for eGovernment Applications
SANS	Escal Institute of Advanced Technologies
SDI	Spatial Data Infrastructure
SITNA	Territorial Information System of Navarre
SME	Small and Medium-sized Enterprises
SOA	Service Oriented Architecture
sTESTA	Secured Trans European Services for Telematics between Administrations
TOGAF	The Open Group Architecture Framework
UDDI	Universal Description, Discovery and Integration
UK-AGI	UK Association for Geographic Information
UML	Unified Modelling Language
UMM	Universal Map Module
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UN-GGIM	United Nations initiative on Global Geospatial Information Management (UN-GGIM)
URI	Uniform Resource Identifier
W3C	World Wide Web Consortium
WIYBY	UK What's In Your Backyard App
XML	eXtensible Markup Language

Definitions

Authentic data	Data that provides an accurate representation of reality with quality parameters that are fit for the intended purposes
Authoritative data	Data from officially regarded sources
EIRA	A structured basis for classifying and organising building blocks relevant to interoperability, which are used in the delivery of digital public services.
Evidence based policy making	The development of public policy which is informed by objective evidence, e.g. through data related to the content of the policy
INSPIRE	Directive 2007/2/EC establishing an infrastructure for spatial information in Europe to support Community environmental policies, and policies or activities which may have an impact on the environment.
Interoperability	The ability of disparate and diverse organisations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organisations, through the business processes they support, by means of the exchange of data between their respective ICT systems;
Location information	Any piece of information that has a location element, such as an address, a postcode, a building or a census area. Most information from diverse sources can be linked to a location. This term can be interchanged with spatial, geospatial, place and geographic information.
Location information strategy	A strategic approach for managing and maximising the value of location information.
Location privacy	The reasonable expectation that an individual cannot be identified without their permission by reference to information regarding their location or objects that may be attributed to them.
Location-enabled services	Services provided by public authorities which depend on effective management or use of location information
Spatial literacy	The ability to use the properties of space to communicate, reason, and solve problems.
Standard	<p>As defined in European legislation (Article 1, paragraph 6, of Directive 98/34/EC), a standard is a technical specification approved by a recognised standardisation body for repeated or continuous application, with which compliance is not compulsory and which is one of the following:</p> <ul style="list-style-type: none">• international standard: a standard adopted by an international standardisation organisation and made available to the public;• European standard: a standard adopted by a European standardisation body and made available to the public;• national standard: a standard adopted by a national standardisation body and made available to the public.

ANNEXES

Annex I – List of recommendations

POLICY AND STRATEGY ALIGNMENT

1. [Location information and e-government strategies should be fundamentally connected in all legal and policy instruments](#)
2. [Location information policy should be integral to and aligned with wider data policy at all levels of government](#)
3. [Public administrations should comply with data protection principles as defined by European and national law when processing location data](#)
4. [Effective location-based analysis should play an important role in evidence based policy making](#)
5. [Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement](#)

E-GOVERNMENT INTEGRATION

6. [Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions](#)
7. [Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties](#)
8. [Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled](#)
9. [An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government](#)

STANDARDISATION AND INTEROPERABILITY

10. [Public administrations should adopt a common architecture to develop e-Government solutions, facilitating the integration of geospatial requirements](#)
11. [Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible](#)
12. [Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services](#)

RETURN ON INVESTMENT

13. [Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities](#)
14. [Communicate the benefits of integrating and using location information in e-Government services](#)
15. [Public administrations should facilitate the use of their location data by non-](#)

governmental actors to stimulate innovation in products and services and enable job creation and growth

EFFECTIVE GOVERNANCE AND PARTNERSHIPS

16. Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal
17. Effective partnering is key to the successful development and exploitation of location data infrastructures
18. There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities

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Annex II – Role-based methodologies

Policy Maker

RECOMMENDATIONS		TASKS			
		Preparation	Adoption	Implementation	Application
POLICY AND STRATEGY ALIGNMENT					
1.	Location information and e-government strategies should be fundamentally connected in all legal and policy instruments	X	X		X
2.	Location information policy should be integral to and aligned with wider data policy at all levels of government	X	X		X
3.	Public administrations should comply with data protection principles as defined by European and national law when processing location data	X	X		X
4.	Effective location-based analysis should play an important role in evidence based policy making	X		X	X
5.	Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement			X	
E-GOVERNMENT INTEGRATION					
6.	Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions	X			X
7.	Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties				
8.	Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled				
9.	An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government	X			X
STANDARDISATION AND INTEROPERABILITY					
10.	Public administrations should adopt a common architecture to				

	develop e-Government solutions, facilitating the integration of geospatial requirements				
11.	Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible	X		X	
12.	Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services				
RETURN ON INVESTMENT					
13.	Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities				X
14.	Communicate the benefits of integrating and using location information in e-Government services				X
15.	Public administrations should facilitate the use of their location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth	X			
EFFECTIVE GOVERNANCE AND PARTNERSHIPS					
16.	Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal	X		X	X
17.	Effective partnering is key to the successful development and exploitation of location data infrastructures				
18.	There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities				X

e-Government Service Owner, Manager and Implementer

RECOMMENDATIONS		TASKS				
		Plan	Design	Develop and test	Introduce and operate	Review and improve
POLICY AND STRATEGY ALIGNMENT						
1.	Location information and e-government strategies should be fundamentally connected in all legal and policy instruments					
2.	Location information policy should be integral to and aligned with wider data policy at all levels of government					
3.	Public administrations should comply with data protection principles as defined by European and national law when processing location data					
4.	Effective location-based analysis should play an important role in evidence based policy making					
5.	Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement	X				
E-GOVERNMENT INTEGRATION						
6.	Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions	X	X	X	X	X
7.	Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties	X	X	X	X	X
8.	Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled	X	X	X	x	X
9.	An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government	X	X	X	X	X
STANDARDISATION AND INTEROPERABILITY						
10.	Public administrations should adopt a common architecture to develop e-Government	X	X			

	solutions, facilitating the integration of geospatial requirements					
11.	Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible	X	X	X	X	
12.	Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services		X	X		
RETURN ON INVESTMENT						
13.	Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities					X
14.	Communicate the benefits of integrating and using location information in e-Government services					
15.	Public administrations should facilitate the use of their location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth				X	X
EFFECTIVE GOVERNANCE AND PARTNERSHIPS						
16.	Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal	X				X
17.	Effective partnering is key to the successful development and exploitation of location data infrastructures	X	X	X	X	X
18.	There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities	X			X	

ICT Manager and Developer

RECOMMENDATIONS	TASKS				
	Plan	Design	Develop and test	Release, operate and maintain	Review and improve
POLICY AND STRATEGY ALIGNMENT					
1. Location information and e-government strategies should be fundamentally connected in all legal and policy instruments					
2. Location information policy should be integral to and aligned with wider data policy at all levels of government					
3. Public administrations should comply with data protection principles as defined by European and national law when processing location data					
4. Effective location-based analysis should play an important role in evidence based policy making					
5. Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement	X				
E-GOVERNMENT INTEGRATION					
6. Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions		X	X	X	X
7. Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties	X	X	X	X	X
8. Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled	X	X	X	X	X
9. An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government	X	X	X	X	X
STANDARDISATION AND INTEROPERABILITY					
10. Public administrations should adopt a common architecture to	X	X			X

	develop e-Government solutions, facilitating the integration of geospatial requirements					
11.	Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible	X	X	X	X	X
12.	Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services		X	X		
RETURN ON INVESTMENT						
13.	Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities					X
14.	Communicate the benefits of integrating and using location information in e-Government services					
15.	Public administrations should facilitate the use of their location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth				X	X
EFFECTIVE GOVERNANCE AND PARTNERSHIPS						
16.	Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal	X				X
17.	Effective partnering is key to the successful development and exploitation of location data infrastructures	X	X	X	X	X
18.	There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities	X				

Data Manager

RECOMMENDATIONS		TASKS						
		Data policy and governance	Data specification and modelling	Data acquisition and quality	Data documentation, organisation and control	Data access, sharing and dissemination	Data warehousing and analytics	Data archiving
POLICY AND STRATEGY ALIGNMENT								
1.	Location information and e-government strategies should be fundamentally connected in all legal and policy instruments	X						
2.	Location information policy should be integral to and aligned with wider data policy at all levels of government	X	X					
3.	Public administrations should comply with data protection principles as defined by European and national law when processing location data	X	X	X	X	X	X	X
4.	Effective location-based analysis should play an important role in evidence based policy making	X	X			X	X	
5.	Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement	X	X	X				
E-GOVERNMENT INTEGRATION								
6.	Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions	X				X		
7.	Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties	X	X	X		X		
8.	Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled	X	X	X		X		
9.	An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government	X	X			X	X	

STANDARDISATION AND INTEROPERABILITY							
10.	Public administrations should adopt a common architecture to develop e-Government solutions, facilitating the integration of geospatial requirements	X	X		X		X
11.	Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible	X		X	X	X	
12.	Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services	X	X		X	X	X
RETURN ON INVESTMENT							
13.	Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities	X					
14.	Communicate the benefits of integrating and using location information in e-Government services	X				X	
15.	Public administrations should facilitate the use of their location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth	X				X	
EFFECTIVE GOVERNANCE AND PARTNERSHIPS							
16.	Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal	X	X	X	X	X	
17.	Effective partnering is key to the successful development and exploitation of location data infrastructures	X					
18.	There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities	X				X	

INSPIRE Data Publisher

RECOMMENDATIONS	TASKS					
	Plan for INSPIRE	Identify spatial data sets	Create and maintain reusable spatial data sets	Provide discovery, view and transformation services	Monitor and report on INSPIRE	Support use of spatial datasets
POLICY AND STRATEGY ALIGNMENT						
1.	Location information and e-government strategies should be fundamentally connected in all legal and policy instruments	X			X	
2.	Location information policy should be integral to and aligned with wider data policy at all levels of government	X	X	X	X	X
3.	Public administrations should comply with data protection principles as defined by European and national law when processing location data	X		X		
4.	Effective location-based analysis should play an important role in evidence based policy making	X	X	X		X
5.	Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement	X		X	X	X
E-GOVERNMENT INTEGRATION						
6.	Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions	X	X			X
7.	Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties	X	X	X	X	X
8.	Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled	X				X
9.	An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government	X	X	X	X	X

STANDARDISATION AND INTEROPERABILITY							
10.	Public administrations should adopt a common architecture to develop e-Government solutions, facilitating the integration of geospatial requirements	X			X	X	
11.	Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible	X	X	X	X	X	
12.	Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services	X	X	X	X	X	
RETURN ON INVESTMENT							
13.	Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities	X					X
14.	Communicate the benefits of integrating and using location information in e-Government services	X					X
15.	Public administrations should facilitate the use of their location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth	X					X
EFFECTIVE GOVERNANCE AND PARTNERSHIPS							
16.	Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal	X					X
17.	Effective partnering is key to the successful development and exploitation of location data infrastructures	X	X				X
18.	There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities	X					X

Private Sector Product and Service Entrepreneur / Developer

RECOMMENDATIONS	TASKS					
	Insight and definition	Proto- typing and develop- ment	Testing and evaluation	Marketing and sales	Deploy- ment	Maint- enance and support
POLICY AND STRATEGY ALIGNMENT						
1. Location information and e-government strategies should be fundamentally connected in all legal and policy instruments						
2. Location information policy should be integral to and aligned with wider data policy at all levels of government	X	X				
3. Public administrations should comply with data protection principles as defined by European and national law when processing location data						
4. Effective location-based analysis should play an important role in evidence based policy making				X	X	X
5. Public administrations should use a standards based approach in the procurement of location data and related services in line with broader ICT standards based procurement		X				
E-GOVERNMENT INTEGRATION						
6. Member States should identify where e-Government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions				X		
7. Public administrations should use INSPIRE and SDI models, data and services for delivering cross-sector and cross-border e-Government services to citizens, businesses, government and other parties	X	X				X
8. Public administrations should adopt an open and collaborative methodology to design and improve e-Government services that are location-enabled	X	X	X	X	X	X
9. An integrated location-based approach should be adopted in the collection and analysis of statistics on different topics and at different levels of government	X			X		
STANDARDISATION AND INTEROPERABILITY						
10. Public administrations should	X	X		X		

	adopt a common architecture to develop e-Government solutions, facilitating the integration of geospatial requirements						
11.	Public administrations should reuse existing authentic data, data services and relevant technical solutions where possible	X	X		X		
12.	Public administrations should apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in e-Government services	X	X		X		
RETURN ON INVESTMENT							
13.	Public administrations should apply a consistent and systematic approach to monitoring the performance of their location information activities						
14.	Communicate the benefits of integrating and using location information in e-Government services						
15.	Public administrations should facilitate the use of their location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth	X	X	X	X	X	X
EFFECTIVE GOVERNANCE AND PARTNERSHIPS							
16.	Integrated governance of location information processes should be introduced at all levels of government, bringing together different governmental and non-governmental actors around a common goal	X			X		
17.	Effective partnering is key to the successful development and exploitation of location data infrastructures	X			X		
18.	There should be investment in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in e-government and support growth opportunities	X					

Annex III – References: Overview of EULF Best Practices

EULF Best Practice 1	A 'generic GIS for e-Government' in Flanders
Country: Belgium	
Policy domain: Agriculture & Spatial planning	
Process owners: Flemish e-Government unit, Agency for Agriculture and Fisheries, Flemish Land Agency and the Department of Spatial Planning, Housing Policy and Immovable Heritage	
Short description: In 2006 the Flemish government started with the development of a 'generic GIS for e-government' (GeGIS). The aim of the GeGIS project was to develop a fast and easy-to-use GIS to view and manage spatial data. One of the first processes that were supported by the GeGIS solution was the registration of agricultural parcels by farmers. The 'Agriculture e-portal' that was built with GeGIS, allows farmers and agriculturists to consult their data, but also to fill in and submit online forms. The development of GeGIS was carried out by a private company in cooperation with a university.	
Recommendations: Policy and Strategy Alignment (1 ; 4); e-Government Integration (8); Standardisation and interoperability (12); Return on Investment (15); Effective Governance and Partnerships (17)	
Link: http://gegis.org	
EULF Best Practice 2	IDOS - Cross-border journey planner for citizens
Country: Czech Republic	
Policy domain: Transport & mobility	
Process owners: Ministry of Transport, Czech Public Transport Operators, Private sector	
Short description: IDOS is a multimodal public transport planner of the Czech Republic integrating international, national, regional and urban public transport connections including bus, rail and air. Any person can access the service online to obtain information on a planned journey including timetables, links to the reservation systems, information about the connection (e.g. time, distance, transfer time).	
Recommendations: e-Government Integration (7); Standardisation and Interoperability (11 ; 12); Return on Investment (15); Effective Governance and Partnerships (17)	
Link: http://jizdnirady.idnes.cz/	
EULF Factsheet: https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20IDOS.pdf	

EULF Best Practice 3 'LoG-IN' to the local economic knowledge base

Country: Belgium, Germany and the United Kingdom

Policy domain: Local economy, tourism, child care, water management, etc.

Process owners: Intercommunale Leiedal (BE), Landkreis Rotenburg-Wümme (DE), Norfolk County Council (UK)

Short description: The LoG-IN project aimed to turn local authorities into key players in the local economy through the development of a Generic Information Infrastructure. This infrastructure allowed them to manage and publish their - location - data and to build their own web applications. One of the first applications that was built with support of this Generic Information Infrastructure was an online overview of all companies in a certain region.

Recommendations: Policy and Strategy Alignment ([2](#); [4](#)); Standardisation and interoperability ([11](#); [12](#)); Return on Investment ([15](#)); Effective Governance and Partnerships ([18](#))

Link: <https://joinup.ec.europa.eu/community/epractice/case/local-governments-3-countries-sharing-one-gis-infrastructure>, <http://www.smartregions.eu/log-0>

EULF Best Practice 4 What's in Your Backyard for farmers

Country: United Kingdom

Policy domain: Environment and agriculture

Process owners: Environment Agency

Short description: One of the key applications at the website of the Environment Agency is What's In Your Backyard (or WIYBY for short). The application provides interactive maps for finding information about the environment: e.g. air pollution, coastal erosion, historic landfills, etc.). A particular application was developed for farmers, to inform them about water bodies in their environment that might be affected by agricultural pollutants.

Recommendations: Policy and Strategy Alignment ([1](#)) ; e-Government Integration ([7](#)); Standardisation and interoperability ([11](#); [12](#))

Link: <http://apps.environment-agency.gov.uk/wiyby/>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20WIYBY.pdf

EULF Best Practice 5

Radiological Emergency Response in Germany

Country: Germany

Policy domain: Emergency management

Process owners: Federal Office for Radiation Protection (BfS), Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Short description: In Germany, the nuclear accident in Chernobyl 1986 prompted the establishment of the 'Integrated Measuring and Information System (IMIS) for the Monitoring of Environmental Radioactivity', operated by the Federal Office for Radiation Protection. In case of emergency, IMIS provides the information necessary to give recommendations and take appropriate countermeasures based on measurements, forecasts and spatial analysis.

Recommendations: Policy and Strategy Alignment (4); Standardisation and interoperability (10; 12)

Link: http://www.bfs.de/EN/topics/ion/accident-management/measuring-network/imis/imis_node.html

EULF Best Practice 6

Digital Exchange platform for spatial plans

Country: The Netherlands

Policy domain: Spatial planning

Process owners: Ministry of Infrastructure and Environment, Kadaster, Dutch Provinces and municipalities, Geonovum

Short description: As part of the initiative 'Digital Exchange of Spatial Processes' (popularly abbreviated as DURP), a digitized environment for spatial planning was created to facilitate the sharing of spatial plans. A portal to make the plans publicly available was established called Ruimtelijkeplannen.nl with the goal to enhance the communication of future plans to professionals and citizens at municipal, provincial, and national levels.

Recommendations: Policy and Strategy Alignment (1; 2); e-Government Integration (7); Standardisation and interoperability (10; 12); Effective Governance and Partnerships (17)

Link: www.ruimtelijkeplannen.nl

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20DURP.pdf

EULF Best Practice 7

National landslide warning system in Italy

Country: Italy

Policy domain: Emergency management

Process owners: CNR Research Institute for Geo-Hydrological Protection (IRPI), Italian Department for Civil Protection

Short description: The Research Institute for Geo-Hydrological Protection (IRPI) of the Italian National Research Council (CNR) started with the development of a national landslide warning system that is used by the Italian Department for Civil Protection. The system daily provides spatially distributed forecasts for the possible occurrence of rainfall-induced landslides in Italy. The main output consists of critical rainfall levels, which are determined from rainfall measurements and rainfall forecasts.

Recommendations: Policy and Strategy Alignment (4); Return on Investment (15)

Link: http://www.protezionecivile.gov.it/jcms/it/allertamento_meteo_idro.wp

EULF Best Practice 8 'One solution for all emergency services' in Poland

Country: Poland

Policy domain: Emergency management

Process owners: Head Office of Geodesy and Cartography, (National) Police, Fire brigades, Emergency services

Short description: The Head Office of Geodesy and Cartography in Poland has developed a geospatial module enhancing the Command Support System of Polish emergency services. This module, the so-called Universal Map Module (UMM), is applicable for all the emergency services and can be integrated in their Command Support Systems in order to deliver "spatial functionality" as a support to their work processes.

Recommendations: Policy and Strategy Alignment (4); e-Government Integration (7); Effective Governance and Partnerships (16; 17)

Link: <http://www.gugik.gov.pl/>

EULF Best Practice 9 Digital Accessibility Map for better informed firemen

Country: The Netherlands

Policy domain: Emergency management

Process owners: Fire brigades, Ministry Infrastructure and Environment, Municipalities, Kadaster

Short description: In the Netherlands, the Digital Accessibility Map was developed to provide firemen up-to-date navigation description and all relevant information about the emergency location. Linking the digital map with the nation-wide registries for Addresses and Buildings makes this information more reliable and quicker available. Due to the Digital Accessibility Map firemen immediately know everything about each address and building.

Recommendations: Policy and Strategy Alignment ([4](#)); Standardisation and Interoperability ([12](#)); Effective Governance and Partnerships ([16](#); [17](#))

Link: <http://www.brandweernederland.nl/>

EULF Best Practice 10 Risk assessment in the Insurance business in Germany

Country: Germany

Policy domain: Flood management

Process owners: German Insurance Association, Insurance companies, Water resource management authorities

Short description: The German Insurance Association (GDV), an umbrella organisation for private insurers in Germany, has developed a zoning system for floods, backwater and heavy rains, the so-called ZÜRS Geo system. Individual insurance companies can make use of this online risk assessment tool to assess the risk of natural hazards (especially flooding) for any requested area risks and determine a risk-related premium.

Recommendations: Return on Investment ([15](#)); Effective Governance and Partnerships [17](#))

Link: <http://www.gdv.de/2015/01/kompass-naturgefahren/>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20ZURS_rev.pdf

EULF Best Practice 11 Base Register of Territorial Identification, Addresses and Real Estates in the Czech Republic

Country: Czech Republic

Policy domain: Broad set of policy domains

Process owners: Czech Office for Surveying, Mapping and Cadastre, Czech Statistical Office, Municipalities, Other

Short description: As one of the four Base Registers in the Czech Republic, the Base Register of Territorial Identification, Addresses and Real Estates (RUIAN) provides up-to-date core location data on administrative units, buildings, addresses, streets and public spaces, geographic names and election districts, as open data. In addition, RUIAN contains information on various characteristics of real estates, buildings and addresses.

Recommendations: e-Government Integration ([7](#)); Standardisation and interoperability ([10](#); [11](#); [12](#)); Return on Investment ([15](#)); Effective Governance and Partnerships ([18](#))

Link: <http://www.cuzk.cz/Uvod/Produkty-a-sluzby/RUIAN/RUIAN.aspx>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20RUIAN%20-%20CZ.pdf

EULF Best Practice 12 Enterprise locations in the Euregio Meuse-Rhine

Country: Germany, the Netherlands & Belgium

Policy domain: Economic policy

Process owners: AGIT (DE), Province of Limburg (NL), Enterprise Flanders, POM Limburg, SPI (BE)

Short description: The Locator is a multi-functional system, consisting of four different modules. Each module provides information on one specific topic. Users can find information about the available plots on business parks, about existing companies on these business parks, about the availability of commercial real estate, and information about settlement conditions.

Recommendations: e-Government Integration ([7](#)); Standardisation and Interoperability ([12](#)); Return on Investment ([15](#)); Effective Governance and Partnerships ([17](#))

Link: <http://www.the-locator.eu/>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20LOCATOR.pdf

EULF Best Practice 13 KLIC to prevent damage caused by excavation works

Country: The Netherlands

Policy domain: Utility management, road works

Process owners: Dutch Cadastre, Utility network operators, Excavation community

Short description: In 2010 The Netherlands introduced the digital information system KLIC to optimize the digital information-exchange between excavators and cable and pipe operators. Before starting excavation works, an excavator needs to submit an application request to KLIC. Network operators deliver the digital information about their cables and pipelines through KLIC to the Cadastre, which provides the information from all network operators to the excavator.

Recommendations: Policy and Strategy Alignment (4); e-Government Integration (7); Standardisation and interoperability (12); Return on Investment (15); Effective Governance and Partnerships (16; 17)

Link: <http://www.kadaster.nl/web/Themas/Registraties/KLIC-WION.htm>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20KLIC.pdf

EULF Best Practice 14 Air quality monitoring and reporting in Belgium

Country: Belgium

Policy domain: Environment

Process owners: Belgian Interregional Environment Agency, Flemish Environment Agency, Brussels Environment, Walloon Agency for Air and Climate

Short description: The Belgian Interregional Environment Agency (IRCEL-CELINE) is responsible for reporting on air quality issues to citizens and policy makers and for transmitting national data concerning air quality to the European level and other international organisations. Several INSPIRE-compliant services are used for reporting and exchanging air quality information through e-Reporting but also for informing the public.

Recommendations: Policy and Strategy Alignment (4); e-Government Integration (6; 7); Standardisation and Interoperability (11); Effective Governance and Partnerships (17)

Link: <http://www.dev.irceline.be/en>

EULF Best Practice 15 Information System of Contaminated Sites in Slovakia

Country: Slovakia

Policy domain: Environmental protection

Process owners: Ministry of Environment, Slovak Environment Agency, Regional Environmental offices, Slovak Environmental Inspectorate

Short description: In Slovakia, an 'Information System of Contaminated Sites' was developed to support and document all processes related to the management of contaminated sites and to provide access to all official information on different measures in the field of contaminated sites. An essential part of the system is the 'Register of Contaminated Sites', which allows searching all information on Contaminated Sites in Slovakia (spatial and non-spatial).

Recommendations: Policy and Strategy Alignment (4); e-Government Integration (7; 8); Standardisation and interoperability (10; 12)

Link: <http://envirozataze.enviroportal.sk/mapa>

EULF Best Practice 16 Managing the granting of licenses for selling tobacco

Country: Spain

Policy domain: Economic policy

Process owners: Commissioner of the Tobacco Market, National Geographic Institute

Short description: According to the Spanish law all tobacco points of sale provide themselves of tobacco from one of the three closest official tobacco delivery establishments. For a permit request for a Tobacco Sales Point, the 'AppTobaccoManagement' application determines the spatial location of the 3 tobacconists nearest the sales point. The AppTobaccoManagement is one of the new services that are built upon data and services of CartoCiudad, the seamless cartographic database of Spain.

Recommendations: Policy and Strategy Alignment (2); e-Government Integration (7); Standardisation and interoperability (11; 12); Return on Investment (15)

Link: <http://www.cmtabacos.es/>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20Tobacco.pdf

EULF Best Practice 17 Location-enabled census data in Poland

Country: Poland

Policy domain: Statistics

Process owners: Central Statistical Office of Poland

Short description: In Poland, the Agricultural Census of 2010 and the Housing Census of 2011 were the first censuses that were completely carried out electronically, without use of paper. Enumerators were equipped with hand-held devices with a mobile application for the execution of the census process. The application contained a map module with orthoimagery and a digital map that assisted the enumerator in locating respondents.

Recommendations: Policy and strategy alignment ([3](#)); e-Government Integration ([7](#); [8](#); [9](#)); Standardisation and interoperability ([11](#));

Link: <http://geo.stat.gov.pl/>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20CENSUS.pdf

EULF Best Practice 18 Territorial Information System of Navarre: SITNA

Country: Spain

Policy domain: Many different policy areas

Process owners: Government of Navarre

Short description: The Government of Navarre started with the implementation of a government-wide Territorial Information System of Navarre (SITNA), in order to coordinate and integrate all information from different departments. On top of SITNA, a broad set of applications have been developed in the past years to support different public sector processes and services: the identification of agrarian parcels within the Common Agricultural Policy aid system, information provision on the air quality and air pollution levels in Navarre, etc.

Recommendations: Policy and Strategy Alignment (1, [4](#)); e-Government Integration ([6](#); [7](#)); Standardisation and interoperability ([10](#); [11](#); [12](#)); Return on Investment ([15](#)); Effective Governance and Partnerships ([16](#); [17](#))

Link: <http://sitna.navarra.es/>

EULF Best Practice 19 Democratisation of soil data in the UK

Country: United Kingdom

Policy domain: Soil protection

Process owners: Natural Environment Research Council, British Geological Survey, Centre for Ecology and Hydrology

Short description: Funded by the Natural Environment Research Council, a smartphone application that brings together soil property data and information from a broad range of research centres and data providers was developed by the British Geological Survey in partnership with the Centre for Ecology and Hydrology. Users of the 'mySoil' application can view soil maps of the UK and EU that provide regional information on soil depth, texture, pH, temperature and organic-matter content, and on vegetation habitats.

Recommendations: e-Government Integration ([7](#); [8](#)); Standardisation and interoperability ([11](#); [12](#)); Return on Investment ([15](#)); Effective Governance and Partnerships ([18](#))

Link: <http://bgs.ac.uk/mySoil/>

EULF Factsheet:

https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/New%20EULF%20Factsheet%20UK%20Soil%20data.pdf

EULF Best Practice 20 **Digital system for building permits in Italy**

Country: Italy

Policy domain: Spatial planning

Process owners: Piedmont Region, Piedmont provinces, Piedmont municipalities

Short description: With the aim of streamlining administrative procedures related to building permits, different public authorities in the Piedmont region in Italy started with the development of MUDE Piedmont, a unified digital system for building permits. The aim of MUDE was to standardize the application forms for building permit requests and of the municipal procedures for managing these requests throughout the region.

Recommendations: Policy and Strategy Alignment ([4](#)); Standardisation and Interoperability ([11](#)); Effective Governance and Partnerships ([16](#); [17](#))

Link: <http://www.mude.piemonte.it/cms/>

EULF Best Practice 21 **Integrated transport solutions: TRAVELINE**

Country: United Kingdom

Policy domain: Transportation

Process owners: Traveline Information Limited (TIL)

Short description: TRAVELINE is an all Great Britain multi-modal travel planning service, which uses route timetables and real time departures for journey planning; an Open Data provider.

It is structured as a private not for profit company among local authority, government, transport operator and passenger group partners. The purpose of TRAVELINE is to promote public transport passenger growth and enable the delivery of high quality mobility information across a mix of channels in a way that represents best value to stakeholders. It has no government or public funding.

Recommendations: Policy and Strategy Alignment (2); e-Government Integration (6,8); Standardisation and Interoperability (11); Return on Investment (15); Effective Governance and Partnerships (16, 17)

Link: www.traveline.info

EULF Best Practice 22 **Standardised road safety data exchange**

Country: Norway, Sweden

Policy domain: Intelligent Transport Systems

Process owners: JRC, ERTICO, Norwegian and Swedish Road Authorities, Norwegian and Swedish Road Authorities, TomTom, HERE

Short description:

The EULF Transportation Pilot aims to improve the flow of up-to-date road safety data between road authorities and private sector map providers in different countries, supporting the aims of the Intelligent Transport Systems Directive and drawing on INSPIRE. It is a collaborative initiative involving the European Commission-Joint Research Centre from its European Union Location Framework (EULF) project, ERTICO's Transport Network ITS Spatial Data Deployment Platform (TN-ITS), including national road authorities and commercial map providers, and the European Location Framework (ELF) project, including national mapping agencies. Its aim is to promote the use of INSPIRE (European Directive setting the Infrastructure for Spatial Information in Europe) within the transport domain, by focusing on the electronic exchange of data among public road authorities and private sector ITS map providers, at a cross-border level, based on authoritative and seamless data compliant with INSPIRE.

Recommendations: e-Government Integration (6; 7; 8); Standardisation and interoperability (11; 12); Return on Investment (14; 15); Effective Governance and Partnerships (16; 17)

Link: https://joinup.ec.europa.eu/community/eulf/og_page/eulf-transportation-pilot

Country: Denmark, Netherlands, Germany

Policy domain: Marine environment

Process owners: JRC, EEA, Danish, Dutch and German Marine Agencies

Short description: The aim of the INSPIRE marine pilot is to help improve the understanding of INSPIRE in the management of Marine Strategy Framework Directive (MSFD)-related spatial information, and to provide guidance and tools that facilitate the mentioned obligations. The activity is funded by the ISA programme as part of the EULF Action, by DG ENV, and by JRC. The EEA, NL, DE, and DK are partners in the first phase project and are contributing in-kind. The pilot takes a few datasets needed to underpin the MSFD reporting, and works out complete examples of INSPIRE-based data management. In the first phase of the pilot this is done for data holdings in NL, DE, and DK. In the second phase the guidelines, tools and expertise are promoted in other countries participating in MSFD Working Group Data Information and Knowledge Exchange (DIKE).

Recommendations: Policy and Strategy Alignment ([2](#); [4](#)); e-Government Integration ([6](#); [7](#)); Standardisation and Interoperability ([10](#); [12](#)); Effective Governance and Partnerships ([16](#); [17](#))

Link: https://joinup.ec.europa.eu/community/eulf/og_page/eulf-marine-pilot

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